An analysis of the transformation potential of office buildings in The Hague

Master thesis

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Preface

This document presents the master thesis written as a part of the master's Management in the Built Environment at the TU Delft. This thesis is conducted in the Department of Real Estate Management, focusing on the theme of Adaptive Reuse. This document consists of a research proposal that presents the strategy that will be implemented to address and answer the research problem coherently and logically. The research proposal is followed by a theoretical and empirical part of this thesis and finalised with the conclusions and reflection.

Lizanne Espinal

Delft, January 2024

Abstract

Sufficient housing supply is one of the most significant issues in the Dutch housing market. The Dutch government aims to realise 15.000 dwellings a year by transforming vacant commercial real estate. However, a discrepancy can be noted between the number of buildings that developers have been willing to transform in the past decade and what the Dutch government deems feasible regarding the transformation of commercial real estate going into the future - a transformation dip. Next to that, office buildings with an energy label worse than C are not allowed to be used as office buildings anymore in 2023 unless they are renovated. This forms an interesting starting point as building owners are required to reassess the potential of the building and choose between different strategies, such as transformation, to prolong the lifespan. Thus, the goal of this thesis is to explore possibilities for bridging the gap between the number of buildings transformed annually on a national scale and the public transformation goals by applying a tool-the Conversion Meter- which aims to locate potential buildings in a city and asses their conversion potential. The Dutch city of The Hague is chosen as a case to apply this method, and the office stock with an energy label worse than C is chosen for the population. The following research question is answered during this thesis: To what extent can the number of office-to-housing conversions in the Netherlands be increased to meet the public goal of realising 15.000 dwellings through transformation a year? Buildings were selected out of an online real estate database using a set of preselected filters- office building in The Hague, with a minimum size of 3000m², not a listed monument and an energy label worse than C. 26 buildings were analysed, and it was determined that approximately 43% of the buildings analysed have a transformation potential based on the results of the Conversion Meter (9 out of 21 buildings-5 buildings discounted) and approximately 29% was deemed to have transformation potential based on the results of the Conversion Meter and the discussions with the expert panel (6 out of 21 buildings). In The Hague, more buildings could be found if smaller buildings are assessed too, as most of the buildings predicted to become economically obsolete (buildings energy label G) are smaller than 500m². Next to that, the normative approach of the Conversion Meter now discriminates against buildings in business parks due to a lack of facilities and location. However, as cities expand, some business parks have become engulfed by the city. The Binckhorst in The Hague is an example of a business park that will be transformed into a mixed-use area where buildings are found. Areas like these in cities provide great opportunities for adding more dwellings through transformation.

Keywords – Adaptive reuse, Transformation potential, Energetic performance, Office buildings, The Hague

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Framing

Figure 1: Transformation of Strijp-S Eindhoven (Van Vonderen, N.D.)

Introduction

The supply of sufficient housing is one of the most significant issues currently observed in the Dutch housing market (Boelhouwer, 2020). The housing shortage is especially an issue in larger cities, where residents experience long waiting lists for social housing and increasing prices for owner-occupied and private rental housing. In particular, these developments affect middle-income groups and first-time home buyers (van der Heijden, 2018). To tackle the housing crisis in the Netherlands, the Dutch government aims to produce 100.000 dwellings per year with the long-term goal of producing 900.000 dwellings by 2030. Thus, according to the "Nationale Woon- en Bouwagenda" produced in 2022, next to newly built dwellings, 15.000 dwellings are expected to be delivered as a consequence of transforming commercial real estate (Ministerie van Binnenlandse Zaken en Koninkrijksrelaties, 2022). As transformation has become more mainstream, it can be noted that since 2012, an average of 15% of the housing production has been produced through transformation (Expertteam Vastgoedtransformatie, 2022). However, a discrepancy can be noted between the number of buildings developers have been willing to transform in the past decade and what the Dutch government deems feasible regarding the transformation of commercial real estate going into the future. To illustrate, the table below depicts the number of dwellings delivered through new-built, transformations and remaining additions (which are all dwellings added to the housing stock for reasons other than new construction such as transformations, splitting housing units or change of use (Centraal Bureau voor de Statistiek, 2021c). This table shows that in the past years, the amount of transformations has been significantly lower, averaging approximately eleven thousand transformations between 2015 and 2020.

Table 1: Additions to the housing stock from 2015 to 2020 (Centraal Bureau voor de Statistiek, 2021c)

	New built	Transformations	Remaining additions
2015	48381	10770	19709
2016	54849	10235	21074
2017	62982	10235	17606
2018	66585	12210	15152
2019	71548	12480	14731
2020	69985	10215	12874

Thus, developers primarily produce dwellings in the Netherlands through new construction instead of conversions. To increase the number of transformations in the Netherlands, there needs to be a sufficient accretion of buildings that have become obsolete and are no longer of value to the building owners. From that point on, different strategies can be implemented to cope with this building stock, such as conversion. The public goal suggests that there are a lot more buildings to be found which are suitable for conversion in Dutch cities. However, where these buildings are situated, their characteristics, and whether they are potentially transformable are unclear. This thesis explores the feasibility of increasing the number of dwellings realised through transformation each year of cities in the Netherlands by exploring the transformation potential of office buildings with an energy label worse than c. Therefore, the following research questions will be explored:

To what extent can the number of office-to-housing conversions in the Netherlands be increased to meet the public goal of realising 15.000 dwellings through transformation a year?

This research question has been translated into the following sub-questions:

1. What makes a building suitable for transformation to residential function?
2. Where are office buildings situated?
3. What is the transformation potential of this building stock, and what are the risks and opportunities present within this building stock when it comes to using transformation as a strategy to prolong its lifespan?
4. How would transforming this building stock affect the number of dwellings delivered through conversions each year?

The city of The Hague was chosen as a case study for this research. Furthermore, a selection of buildings will be made by filtering on specific characteristics using the real estate database Vastgoeddata.nl. Consequently, the potential of transforming this stock of buildings in The Hague is analysed by applying the Conversion Meter developed at the TU Delft. The results of this data are discussed with developers through interviews.

This document consists of three parts: the framing, the theoretical framework, and the empirical part. The framing presents the line of reasoning implemented to get to the problem statement and the research questions. It also presents the methodology executed in the theoretical framework and the empirical research. The theoretical framework presents the definitions and background of the main concepts relevant to conducting the research. Moreover, the empirical research shows the results, followed by the discussion and conclusion.

1.1 Problem analysis

The problem analysis consists of two parts: firstly, a summary of the most significant issues in the housing market in The Netherlands caused by a quantitative housing shortage. Followed by a comparison of the transformation goals for the coming years and the number of dwellings produced through transformations in the past decade.

The housing market

Demand for housing

In contrast to the commercial real estate market, a different relationship is observed in the Netherlands housing market regarding the supply and demand of housing. The housing supply still lags behind the demand (Boelhouwer, 2020). Because of this, the waiting period for social housing has increased to an average of 7 years, with outliers averaging around fifteen to twenty years. Next, the rent prices for free market rented dwellings have also increased because of the shortage. This shortage is caused by increased population growth (Boelhouwer & van der Heijden, 2022). Next to the population growth, households are also becoming smaller, which increases the need for more housing. The figure below depicts the population development in the Netherlands from 2002 until 2022 (Centraal Bureau voor de Statistiek, 2022b).

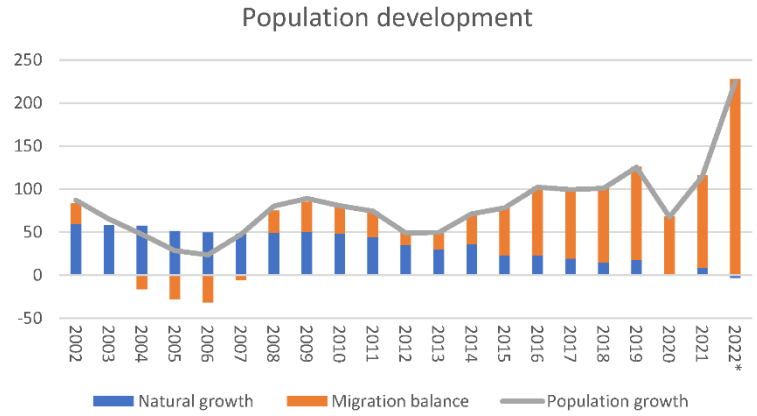


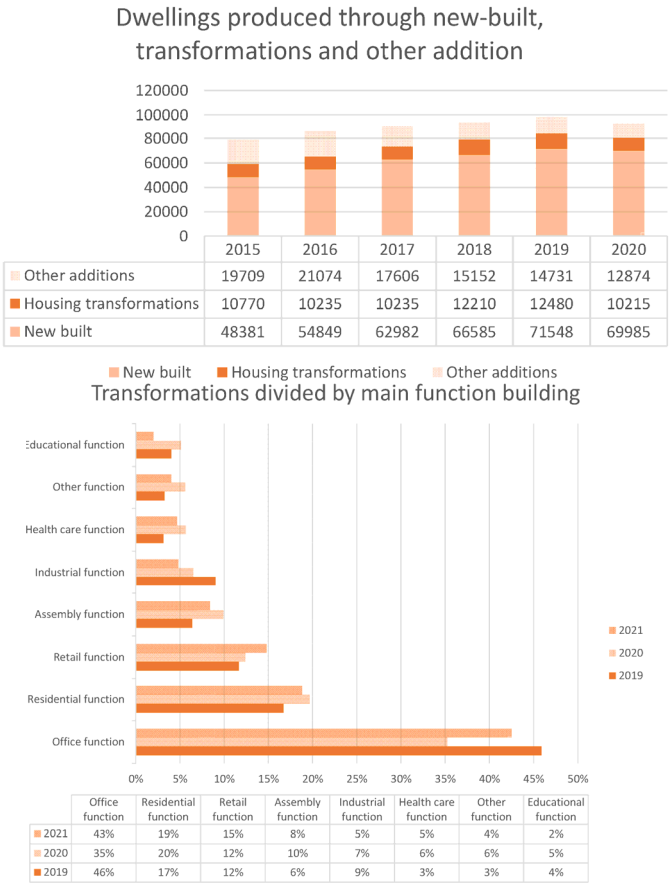
Figure 2: Population growth in the Netherlands from 2002 up to 2022 showing natural growth as well as growth through migration (Centraal Bureau voor de Statistiek, 2022b)

The groups affected the most by the housing shortage are the starters, middle-income households (non-owner-occupied) and the elderly. The starters and middle-income earners run into similar problems in the housing market. Next to an overall housing shortage, it can be noted that the sharp increase in housing prices and the strict rules to qualify for social housing exacerbate the problems observed in the housing market (Boelhouwer & van der Heijden, 2022). Starters are also more frequently faced with long waiting periods for social housing, whilst the private rent and owner-occupied sector do not provide appropriate and affordable alternatives. As a result, starters are often forced to live longer with their parents in non-self-contained housing units such as student housing, move to less desirable locations or accept a dwelling with less living quality (Boelhouwer & van der Heijden, 2022). More pressure is put on the housing market due to a rapidly ageing population, as the current housing stock is not aligned with the needs of this target group. Furthermore, there is a shortage of specific housing products, such as clustered housing, to support this target group. A secondary consequence of the lack of appropriate housing for the elderly is that the elderly are not

able to move out of their current housing, making these dwellings- which are suitable for families and starters- unavailable to them (Boelhouwer & van der Heijden, 2022).

The office market

The CBS monitors the number of dwellings produced through transformations yearly. Approximately 15% of the housing production since 2012 has been delivered through transformations (NVM Business, 2021b). Most transformations have occurred in previous office buildings (approximately 43% in 2021). The figure below shows the percentage of transformations executed from 2015 up to 2020 and the number of transformations divided by the function of the building (Centraal Bureau voor de Statistiek, 2023b). On average, 11.024 dwellings were produced during these years, with the most delivered in 2019 (12.480).



	2015	2016	2017	2018	2019	2020
Other additions	19709	21074	17606	15152	14731	12874
Housing transformations	10770	10235	10235	12210	12480	10215
New built	48381	54849	62982	66585	71548	69985

	Office function	Residential function	Retail function	Assembly function	Industrial function	Health care function	Other function	Educational function
2021	43%	19%	15%	8%	5%	5%	4%	2%
2020	35%	20%	12%	10%	7%	6%	6%	5%
2019	46%	17%	12%	6%	9%	3%	3%	4%

Figure 3: Graph depicting dwellings produced through a transformation from 2015-2020 (Centraal Bureau voor de Statistiek, 2021c) as well as a graph depicting transformations divided by the primary function of the pre-transformed building (Centraal Bureau voor de Statistiek, 2023b)

To transform, the functional and economic lifespan of a building must end for it to become available for transformation. In the early 2000s, transformation projects were not as popular; however, after the financial crisis of 2008, the vacancy rates in the office market rose, leading banks to pay closer attention to vacancies and the rentability of office buildings when (re)financing in the aftermath of the crisis. Despite owners being reluctant to admit that vacancies were an issue, the provinces and municipalities proactively approached and informed building owners of vacant buildings of the market situation. Transformation projects continued to be popular between 2010 and 2014 since many building owners became trapped because of a lack of rental income and debts higher than the appraisal value of the building. Thus, buildings came on the market due to foreclosure, and large property portfolios were sold to new investors at rock-bottom prices. Next to this, the number of new projects built during the crisis also decreased. Developers and contractors focused more on transforming empty office buildings and monuments as these projects were deemed more manageable, and the fact that the dwellings were delivered on the market in small amounts at a time was also seen as a bonus. These trends led to a spike in the number of office withdrawals in 2014-2016 and a spike in the number of transformations in the years that followed. Builders also got interested in transformations in 2016 because the housing prices increased faster than the prices for vacant buildings (NVM Business, 2021b).

Proportions of goals

However, following the transformation peak in 2018 and 2019, a decline can be seen in the number of dwellings delivered through transformation in 2020 (10215 dwellings) and 2021 (9500 dwellings). This is the effect of withdrawing many office buildings for transformation in the previous years (Expertteam Vastgoedtransformatie, 2022). It can also be seen that the rate at which larger supply is being removed from the stock of office buildings for transformation or demolition has stagnated (NVM Business, 2022). This is commonly assumed because the “low-hanging fruit” has been picked. Next, there is also restraint on the market for constructing new office buildings. In 2021, this was, for example, due to the rise of construction and material costs. In addition, many municipalities are cautious in approving plans to construct new office buildings, as many had to deal with an oversupply not long ago (NVM Business, 2022). Next to a decline in the supply, buildings have been on the market for a long time. These are primarily obsolete buildings with low energy labels in areas with insufficient demand. The provinces with the highest share of structurally vacant buildings are Limburg, Zuid-Holland and Zeeland (NVM Business, 2022).

An element of the goal to realise 100.000 dwellings a year is also the goal to realise 15.000 dwellings a year through transformation to combat the housing crisis in The Netherlands. Dwellings which are produced through transformations are typically small. Almost half of the dwellings have a maximum surface area of 50 m², approximately a quarter has a surface area between 50 to 75 m² and a quarter is larger than 75 m² (NVM Business, 2021b). This is because many transformation projects were executed in large cities for students and starters (Expertteam Vastgoedtransformatie, 2022). Using these numbers, it can be noted that per year, approximately 750.000 m² (50 m² x15.000) of space would have to be transformed successfully to achieve these public goals. Since not every project initiated is also successfully transformed, this number should be higher.

Table 2: Numerical representation of transformation goals compared to the average of transformed buildings from 2015 to 2020

	Average size transformation dwelling in m² (NVM Business, 2021b)	**Number of m² which must be transformed per year**	**Number of buildings needed for 500 m² building and 5000 m²building (Centraal Bureau voor de Statistiek, 2020b)**	
A	B	C=A X B	D=C/500m²	E=C/5000m²
15.000 dwellings per year	50 m²	750.000 m²	1500 buildings	150 buildings
An average of 11.024 dwellings produced during 2015-2020	50 m²	551.200 m²	1102,4 buildings	110,24 buildings

Buildings equal to or larger than 5000 m² are transformed less frequently, even though they deliver many dwellings. Approximately a third of all transformations are done in buildings with a minimum size of 500 m² up to 5000 m² (Centraal Bureau voor de Statistiek, 2020b). To illustrate further, approximately 1500 buildings with a size of 500m² would have to be transformed each year or 150 buildings with a size of 5000m², to reach the public goals. The figure below shows how many buildings are needed to realise 15.000 dwellings in a year compared to the average amount of dwellings delivered between 2015 and 2020 (translated into buildings of 500m²). This amounts to a discrepancy of almost 400 buildings (assuming a building size 500m²).

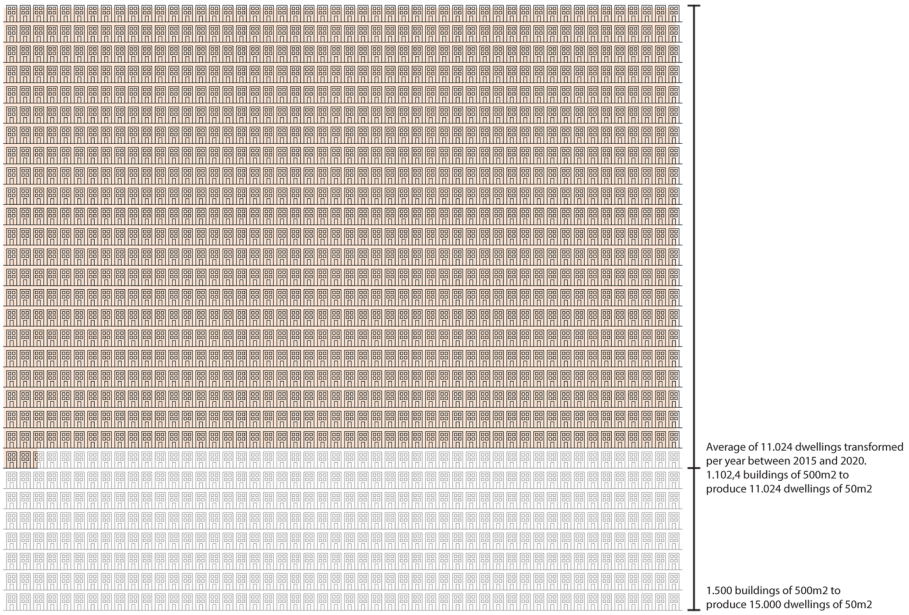


Figure 4: Number of buildings needed to meet the public goal to produce 15.000 dwellings a year through transformation, assuming an average dwelling size of 50 m² and an average building size of 500 m² buildings versus the average transformed between 2015 and 2020 (own image)

Bottlenecks of the re-development process of office buildings

To better understand how the developers in the Netherlands go about transformations, preliminary interviews were held with four developers. These developers worked at different firms, meaning they had different development aims (e.g., housing corporation, developing construction company, independent developer). These interviews aimed to discover the bottlenecks developers experienced in the transformation field in recent years. The bottlenecks were brought up because the interviews occurred at different stages of development. The following development phases are recognised in real estate development: initiation, feasibility, commitment, construction, and management (Gehner, 2008).

The first bottleneck noted by the developers is a consequence of the multi-disciplinary nature of development activity and can be found in the *commitment and construction phases*. Some developers are said to have problems with "entitlement" because of insufficient capacity at the municipal level. Contact with the municipality is vital in obtaining the proper building permits or requesting changes to the zoning plan, for example. Plans run into delays because of a lack of personnel at the municipalities. Next to that, some developers also note that the municipalities have high ambitions, which are a source of complications during development. A sudden shift in external demands can significantly impact the feasibility of a project scheme (e.g., the ratio of social housing on a plot of land compared to mid-segment and private-sector housing shifts).

The next bottleneck noted can be found in the *construction* phase. The developers point out that the contractor's budget consists of two main components: the cost of labour and the cost of materials. When it comes to the cost of labour, a scarcity of construction workers can impact the ability of the contractor to finalise the job within the agreed time and budget. Consequently, in labour scarcity, contractors may not be as willing to commit to projects, especially if the contractor deems the project too complicated. Next, the developers also point out that a bottleneck is formed due to increased building costs (e.g., costs of adding balconies to the buildings, installation costs, costs of finding Asbestos during construction).

Furthermore, the issues of rising construction costs, stricter regulations at a municipal level, stacked ambitions and lack of capacity in the municipality were also noted in reports by Stichting Ymere (2021). The table below presents an overview of the main bottlenecks discussed above and other factors that developers mentioned, such as difficulties in finding suitable buildings and building owners willing to sell the building for transformation. Furthermore, the value of converting a building to housing, as opposed to other functions, which are financially more attractive in certain areas, was also pointed out.

Table 3: Overview bottlenecks stated by developers (own table)

Developer	1	2	3	4	Online source
Lack of capacity at the municipal level	X	X	X		X
Increasingly high ambitions/requirements at the municipal level	X	X	X		X
Increases in cost of labour periodic shortage of construction workers			X		
Quality housing is not sufficient		X			
Increasingly high construction costs	X	X			X
Difficulty finding suitable buildings/building owners willing to sell				X	
Size projects small/ building shared				X	
Asking price property owner high	X			X	
Value of conversion to housing vs other functions				X	

1. R. Mackay (Egeria-independent developer), personal communication, April 13, 2022
2. S. Bonarius (Eigenhaard-housing association), personal communication, April 21, 2022
3. A. Basak (Lingotto-independent developer), personal communication, April 29, 2022
4. S. Pronk (Van Wijnen-developing builders), personal communication, May 5, 2022

1.2 Problem statement

To increase the number of transformations in The Netherlands, there needs to be a sufficient accretion of buildings that have become or will become obsolete and are no longer valuable to the building owners. From that point on, different strategies can be implemented to cope with this building stock, such as conversion. In the past, a lot has been transformed in the Netherlands, primarily because of the financial crisis that led to the withdrawal of many office buildings from the office stock. This has led to a peak in the number of dwellings delivered through transformations in 2018 and 2019. However, these amounts are still far removed from the goal to deliver 15.000 a year through transformations. This public goal suggests that there are a lot more buildings to be found which are suitable for conversion in Dutch cities. However, where these buildings are situated, their characteristics, and whether they are potentially transformable are unclear.

1.3 Research questions

This chapter discusses the research questions and sub-questions which will be addressed during this thesis. The main research question is as follows: To what extent can the number of office-to-housing conversions in the Netherlands be increased to meet the public goal of realising 15.000 dwellings through transformation a year?

This research question has been translated into the following sub-questions:

1. What makes a building suitable for transformation to residential function?
2. Where are office buildings situated?
3. What is the transformation potential of this building stock, and what are the risks and opportunities present within this building stock when it comes to using transformation as a strategy to prolong its lifespan?
4. How would transforming this building stock affect the number of dwellings delivered through conversions each year?

1.4 Goal and result

This thesis explores the feasibility of increasing the number of dwellings realised through transformation each year of cities in the Netherlands by exploring the transformation potential of office buildings with an energy label worse than c. This is done because these buildings must be upgraded legislatively or not be used as office buildings as of 2023. This means that the building owners will have to either renovate the buildings or choose a different strategy, making this group of buildings interesting. To limit the scope of the research, the city of The Hague is chosen as a case. The national government stipulates the goal to realise 15.000 dwellings a year through transformation, which must be adopted by individual municipalities to be realised. Therefore, the method that will be applied to discover the potential of the office stock in the Hague could give the municipality of The Hague a better view of the number of square meters that could be added to the housing stock. This method could be applied to other cities to discover the number of square meters that could be transformed. The product will be an overview of the transformation potential in The Hague and provide insights because of the implementation of the Conversion Meter.

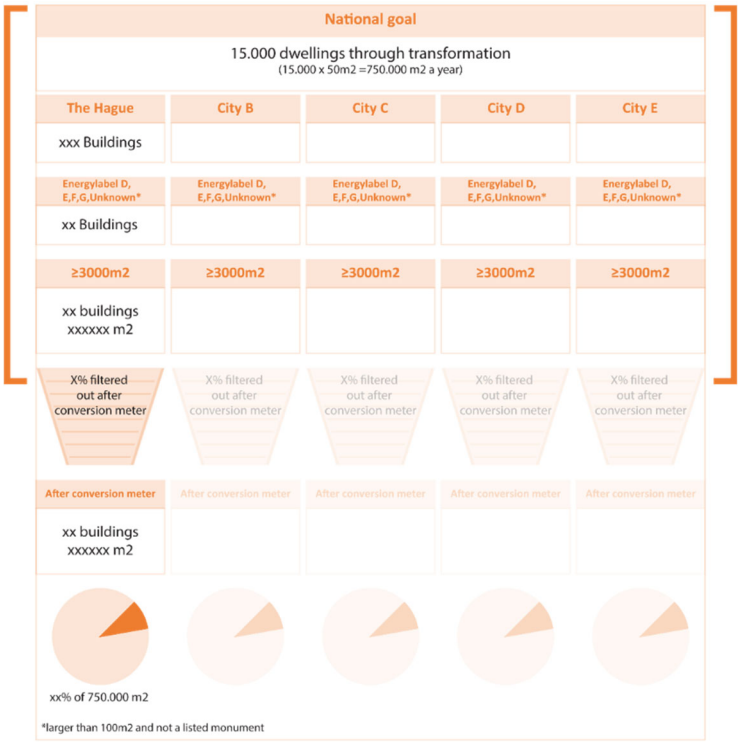


Figure 5: Conceptual framework showing goal of research (own image)

1.5 Scope and area of research

To limit the scope of the research, the focus will be put on the transformation of office buildings, as office-to-housing conversions make up the majority of transformations in The Netherlands compared to other types of real estate (Centraal Bureau voor de Statistiek, 2022a). Furthermore, this paragraph presents the reasoning behind choosing an area for the analysis of the conversion potential of the office stock. The figure below shows the ten municipalities where most transformations occurred between 2015 and 2021. Amsterdam is number one with 24% of housing transformations, followed by The Hague and Eindhoven. Muller (2008) executed similar research in 2008 for Amsterdam; therefore, this city is discounted.

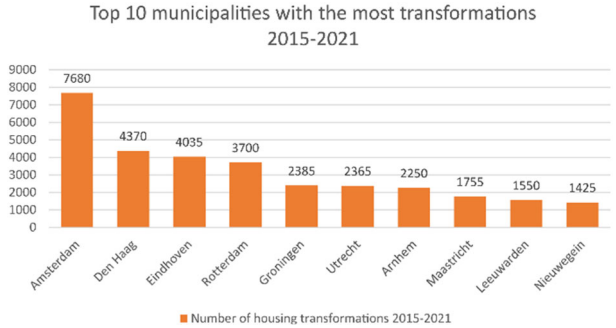
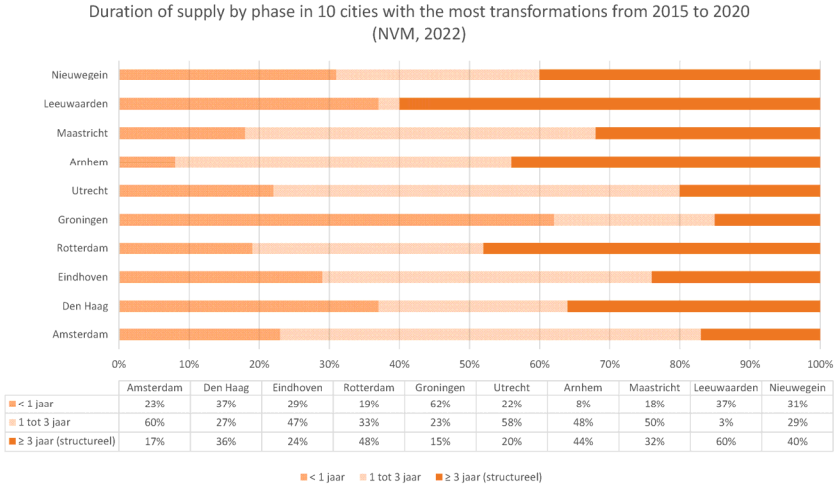


Figure 6: Top 10 municipalities with the most amount of transformations 2015-2020 (Centraal Bureau voor de Statistiek, 2022a)

First, the number of office buildings in the ten municipalities where the most transformations occurred between 2015 and 2021 have been selected to choose a city. This data is selected using the database

from Vastgoeddata.nl. The number of office buildings in each municipality is displayed in the table below, with Amsterdam coming in first place (1392), secondly Rotterdam (844), and thirdly The Hague (721). Looking at the *no end-user known* filter in Vastgoeddata (2023), meaning that in the Kamer van Koophandel (KVK), there is no company assigned to that address, it can be noted that on average, approximately 30% of the buildings have no end user with the highest being numbers being in Amsterdam (345 buildings), Rotterdam (255 buildings) and The Hague (236 buildings). However, this filter does not sketch a clear view of the length of vacancy in each city. The NVM Business (2022) reports on the most critical developments in the Dutch office market on a national and provincial level. It reports that 60% of the stock in Leeuwarden is structurally vacant compared to 48% of office buildings in Rotterdam and 44% in Arnhem (Figure 7).



	Amsterdam	Den Haag	Eindhoven	Rotterdam	Groningen	Utrecht	Arnhem	Maastricht	Leeuwaarden	Nieuwegein
< 1 jaar	23%	37%	29%	19%	62%	22%	8%	18%	37%	31%
1 tot 3 jaar	60%	27%	47%	33%	23%	58%	48%	50%	3%	29%
≥ 3 jaar (structureel)	17%	36%	24%	48%	15%	20%	44%	32%	60%	40%

Figure 7: Duration of supply by phase in 10 cities with the most transformations from 2015 up to 2020 (NVM Business, 2022)

It can also be noted that approximately 50% of the office buildings within these municipalities currently have an energy label of D, E, F, G or Unknown. When looking at the percentage of buildings in the figure below, with an energy label worse than C relative to the number of buildings in each city, it can be noted that most of these buildings are in Maastricht (72%), followed by The Hague (69%) and Arnhem (66%).

Table 4: Compilation of the number of office buildings in each city, the number of buildings for which an end user is registered in KVK and the number of buildings with an energy label worse than C. This graph was produced in February 2023 using Vastgoeddata (2023).

	Amsterdam	Den Haag	Eindhoven	Rotterdam	Groningen	Utrecht	Arnhem	Maastricht	Leeuwarden	Nieuwegein	Total	Average
N office buildings	1392	721	518	844	562	190	363	257	323	91	5261	-
%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	-	-
N no end user known	345	236	117	255	186	72	135	77	136	13	1572	
% of N office buildings	24,78%	32,73%	22,59%	30,21%	33,10%	37,89%	37,19%	29,96%	42,11%	14,29%	-	30,48%
Energy label D,E,F,G or Unknown	766	496	209	463	318	75	238	186	198	27	2976	-
% of N office buildings	55,03%	68,79%	40,35%	54,86%	56,58%	39,47%	65,56%	72,37%	61,30%	29,67%	-	54,40%

Out of Amsterdam, Rotterdam, and The Hague, which were the cities with the most amount of office buildings, the city of The Hague has the highest percentage of office buildings which have an insufficient energy label, requiring building owners to invest in them to prolong the usage as office building. Alternatively, the building owners can also decide on other strategies, such as demolition

and development of new buildings or transformation. Therefore, the city of The Hague is chosen as a starting point for the high number of office buildings with a "bad" energy label.

1.6 Research method

Within this section, the research methodology will be described. Miles et al. (1994) state that conceptual frameworks highlight- in graphic form or narrative form- the main concepts, key factors, constructs, or variables that will be studied during the research to explain their interrelationships. Thus, the conceptual framework depicts the researcher's current "map of the territory" under investigation, which will be updated and become more differentiated as more knowledge is gained (Miles et al., 1994). The figure below depicts the conceptual framework applied during this thesis. This thesis explores the feasibility of increasing the number of dwellings realised through transformation each year of cities in The Netherlands by exploring the transformation potential of office buildings, which currently have an energy label worse than c in The Hague. Thus, the central concept that will be touched upon in this research is the transformation potential of office buildings, which must be renovated to continue their use by focusing on the stock with a bad energy label. This information should give insight into the number of theoretically available buildings that could be proactively transformed.

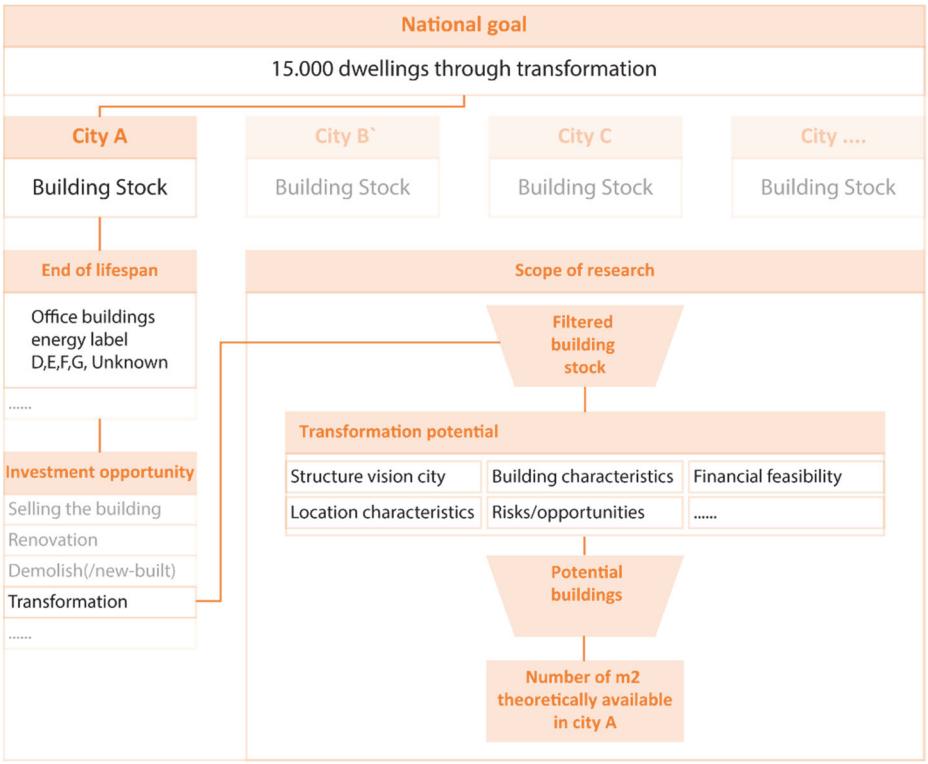


Figure 8: Conceptual framework for thesis (own image)

Conversion Potential Assessment Tool

As a result of research done in the field of Adaptive Reuse, many tools and instruments have been created to discover the transformation potential of buildings. One of these tools is the Conversion Potential Assessment Tool - also called the Conversion Meter - previously known as the Transformation Meter. The development of the Conversion Meter started in the '90s and has since seen several iterations and optimisations. The tool assumes that several factors may influence the strategy to cope with vacancy in an area, namely functional, cultural, technical, legal, and financial factors. These factors can be analysed on the market level by looking at the stakeholders involved and on a locational and building level (Geraedts et al., 2017). The Conversion Meter aims to evaluate the risks and opportunities of office-to-housing conversions. The conversion potential is consequently defined and summarised systematically (Geraedts et al., 2017). The Conversion Meter consists of a pre-step followed by five steps, with each step increasing in specificity and level of detail (Table 5). An expert panel was consulted with the goal of discussing the validity of the criteria of the Conversion Meter and to review the applicability of the tool. Furthermore, the buildings were also analysed by an expert panel to calibrate the results of the Conversion Meter.

Table 5: Conversion Meter Process (Geraedts et al., 2017)

Step	Action	Level	Outcome
Step 0	Inventory market supply of unoccupied offices	Stock	Location of unoccupied offices
Step 1	Quick scan, initial appraisal of unoccupied offices using veto criteria	Location Building	Selection or rejection of offices for further study; Go No / Go decision
Step 2	Feasibility scan: further appraisal using gradual criteria	Location Building	Judgement about the transformation potential of office buildings
Step 3	Determination of transformation class	Location Building	Indicates transformation potential on a 5-point scale from excellent to not transformable
Further analysis (optional and may be performed in reverse order if so desired):			
Step 4	Financial feasibility scan using design	Building	Indicates financial/economic feasibility Sketch and cost-benefit analysis; Go / No Go decision
Step 5	Risk assessment checklist	Location Building	Highlights areas of concern in transformation plan; Go / No Go decision

Starting with Step 0: Inventory of supply at city, district or portfolio level, the pre-step aims at providing an inventory of the market supply of office buildings in a particular area which have been dealing with vacancies for a considerable amount of time or which are expected to become vacant in the future. The Conversion Potential Assessment Tool is used once the Pre-step is completed. The database Vastgoeddata.nl will be used to produce the inventory of office buildings. Vastgoeddata.nl contains real estate data throughout the Netherlands and information about the end users. It overviews linked data from government organisations, brokers, and credit information providers (Vastgoeddata, N.D.). The following filters will be applied to provide an overview of office buildings.

Architectural purpose

The database categorises all buildings according to their architectural purpose per the building code used for the "Basisregistratie Adressen en Gebouwen (BAG) ". Thus, the Architectural purpose of "Office" will be chosen for this research.

Energy label

Next to that, as legislatively, only office buildings with an energy label of C or higher are allowed to be used as office buildings by 2023; the stock of buildings with a label of D, E, G or energy label "unknown" will be zoomed in on. This information is gathered through Vastgoeddata.nl and received from Rijksdienst voor Ondernemend Nederland. As of the first of January 2023, 55% of office buildings comply with this rule, meaning they have an energy label of c or better. 10% have a label of D or worse, and 35% have not yet been labelled (Rijksdienst voor Ondernemend Nederland, 2018).

Listed monument

Next, listed monuments are excluded as these buildings are more complex to transform. This is due to requirements to preserve national monuments, which can complicate the feasibility of transformation to housing (Geraedts et al., 2017). Monuments are also excluded from the requirement of having an energy label better than C.

Useable floor area

Most buildings that are transformed have a size between 500 m² and 5000 m² (Centraal Bureau voor de Statistiek, 2020b). The minimum building size is highly dependent on the parties involved in the process. For this research, buildings with a usable floor area of at least 3000m² were selected.

The first step of the appraisal, called "Step 1: Quick Scan; first impression, evaluation based on veto criteria", consists of executing a quick initial appraisal of the potential to convert the inventory of supply acquired during the pre-step using six veto criteria (Market, Stakeholders, Location and Building). Buildings that fail to comply with the criteria have insufficient conversion potential (No-go decision). Secondly, the viability of conversion is assessed through gradual criteria during "Step 2: Feasibility scan based on gradual criteria". Gradual criteria are qualitative criteria that do not directly lead to a GO/NO GO decision but aim to communicate the conversion potential of the buildings and the locations in the inventory through a numerical score. Thus, this part of the appraisal is divided into a feasibility scan at a locational level, consisting of 7 main criteria, and a feasibility scan at a building level, consisting of 14 main criteria. The third step, "Step 3: Determination of the conversion potential class", consists of assigning the buildings with a conversion potential score using five conversion classes (‘No transformation potential’, ‘Hardly any transformation potential’, ‘Limited transformation Potential’, ‘High transformation potential’, ‘Excellent Transformation Potential’). Following this, a decision can be made to investigate the conversion potential of the building further, or in the case of a no-go decision, the building is dumped out of the supply inventory. The fourth step of the appraisal, also named "Step 4: Financial feasibility scan", is geared at producing an idea of the viability of the conversion project through a comparison of the costs and revenues of the conversion project based on key figures. This calculation remains an estimate as not every cost is included. The last step of the appraisal, "Step 5: Risk assessment checklist with possible solutions", consists of creating an inventory of the risks associated with the conversion project and methods which can be employed to mitigate those risks. Within this step, it is essential to take account of risks that have an impact on a building

level, on a locational level, and on the stakeholder who is responsible for the risk (Geraedts et al., 2017).

Limitations

One of the limitations of the research is the fact that the research is speculative and based on data which could have been altered during the time of writing. For example, some buildings were discounted during the writing process because online documents were found suggesting that the building was already being renovated or demolished. Because of the long development process, there is a lag between the start of, for example, the renovation process, the completion of that process and the registration of that in databases such as Vastgoeddata (2023).

Next, due the time constraint, some of the filters used were applied to keep the sample size manageable (e.g., focusing on the city The Hague or focusing on buildings with a bad energy label). To illustrate, filtering on building size is not equally relevant from a research perspective alone, however, most interviews held were with developers at the graduation company, Van Wijnen (see below). Van Wijnen is a large construction concern that predominantly transforms mid to large sized buildings. Thus, buildings were initially filtered on account of the size that is interesting for such a construction concern (≥3000m^2). This also resulted in a smaller sample size.

Graduation company

Several different types of real estate developers can be differentiated. The developer's background determines to a large degree what type of projects they would invest in (e.g., location, sector, size). The type of developer also has an impact on the goal of the development (Mackaaij & Nozeman, 2014). For this thesis, the developing builder Van Wijnen has been chosen. Developing builders originate from construction companies; therefore, they are predominantly focused on the construction process and the opportunities of a large construction volume (Mackaaij & Nozeman, 2014). Van Wijnen has five service lines: (area) development, construction, transformation, renovation, and maintenance. The figures below show a few transformation projects executed by Van Wijnen in the past years.

Figure 9: Transformation of UWV office building to housing in Deventer (Van Wijnen, N.D.-b)

Figure 10: Transformation of a monastery in Amersfoort into care apartments (Van Wijnen, N.D.-a)

Figure 11: Transformation of DCMR building in Schiedam into apartments (Van Wijnen, N.D.-b)

Data plan and ethical considerations

Since information is gathered informally through weekly meetings with workers at Van Wijnen and planned interviews throughout the process, this paragraph describes how the data will be stored. Firstly, consent to record the interviews will be asked at the beginning of each interview.

Consequently, the recordings are saved on the company's OneDrive account, which is private and will not be published anywhere.

1.7 Relevance and applicability

Real estate (re-)development is a long-term activity encompassing high uncertainty and complexity. According to Coppens et al. (2021) and their typology of risks which impact the long-term planning and design of the built environment, market uncertainty- which refers to the interplay between supply and demand within a property market- plays an important role. Commercial real estate production over time has been observed to have a cyclical pattern- the hog cycle- in which there is an oversupply of real estate after a period of scarcity. Developers produce real estate speculatively. However, as real estate development is a long-term activity, the demand has diminished when the buildings are put on the market (Zijlstra, 2015). Next to that, Policy uncertainties - which refer to uncertainties brought about because of regulations and decisions made by public authority- can also impact the (re)development of office buildings (e.g., from 2023, only office buildings with an energy label C or better are allowed to be in use except for monumental buildings and office buildings smaller than 100 m^2). Force majeure or 'unknown unknowns', which refer to extreme and disruptive events which rarely happen (e.g., the COVID-19 pandemic and 2008 financial crisis), can also impact the development of office buildings. Such events can impact the commercial real estate market. Thus, proactively thinking about coping with changes in the real estate stock is imperative to maintaining the high quality of the urban environment. Secondly, municipalities are responsible for supporting national goals and implementing them into their local development plans. The results of this thesis could give municipalities a fairer view of the feasibility of adding more dwellings through transformation in their respective cities. The research method could also be replicated for other cities to give insights to other municipalities to determine on a regional level in which cities more buildings can potentially be transformed.

Figure 12: Transformation of Het Zandkasteel in Amsterdam, also known as the Amsterdamse Poort, which used to be the headquarters of ING. The buildings are being transformed into housing, retail, office space, and public functions (Fiering, N.D.)

1.8 Buildings and their lifespans

Three forms of lifespans are associated with real estate: the functional lifespan, the technical lifespan, and the economic lifespan (van Vliet et al., 2004). The functional lifespan of the building refers to the period in which the building can meet the functional requirements and wishes stipulated by the users (van Vliet et al., 2004). The degree to which a building is deemed suitable for the activities that need to occur varies per user, as each user has different experiences, tastes, and knowledge. Figure 13 depicts the functional lifespan of a building. It shows the instance in which the property is revived by the owner who chooses to invest in the functional lifespan to accommodate other users who have different requirements concerning the building (van Vliet et al., 2004). The functional lifespan of buildings is shortened primarily by increasing the qualitative requirements of the users concerning the building (e.g., spatial layout, technological implementation).

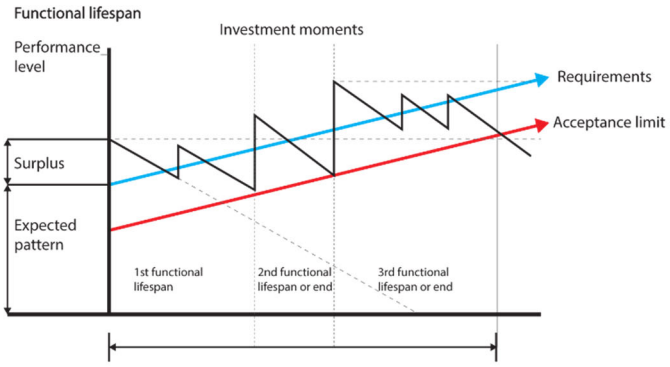


Figure 13: depiction of functional lifespan adapted from van Vliet et al. (2004)

Next to the functional lifespan, buildings also have an economic lifespan, which is when the benefits of operating a building are more significant than the costs (van Vliet et al., 2004). When it comes to commercial property owners, the benefits for the property investor are primarily expressed in monetary terms (cashflows). For the building user (e.g., a company renting an office space), the benefits of the building are based on the degree to which the building supports the business process or the business image, for example. The figure below depicts the end of the economic lifespan of the building as the costs outweigh the benefits (van Vliet et al., 2004). The performance of any built object is determined by the degree to which the building can respond to the demands for which it was initially built. Therefore, regular interventions would have to be made to maintain the performance of the building at the level required by the users. Thus, the building owner can prolong its lifespan by performing regular maintenance and investments (van Vliet et al., 2004).

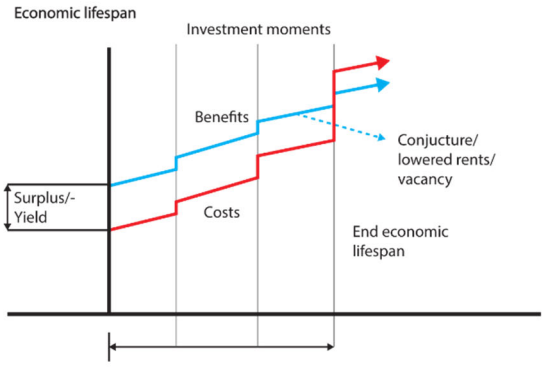


Figure 14: depiction of economic lifespan adapted from van Vliet et al. (2004)

The technical lifespan of the building ends once the building cannot meet the technical and physical building requirements needed to guarantee the users' safe and healthy usage of the building. van Vliet et al. (2004) point out that the technical quality of the building is reduced over time because of five factors. Firstly, the quality is influenced by external factors such as the sun, rain, and wind. Secondly, the building materials deteriorate over time because of intrinsic ageing. Next to that, daily building usage will also cause deterioration (e.g., installations, floors). Regulations can also influence the technical lifespan of the building. Lastly, the wishes and expectations of users and owners can negatively impact the technical lifespan of the building.

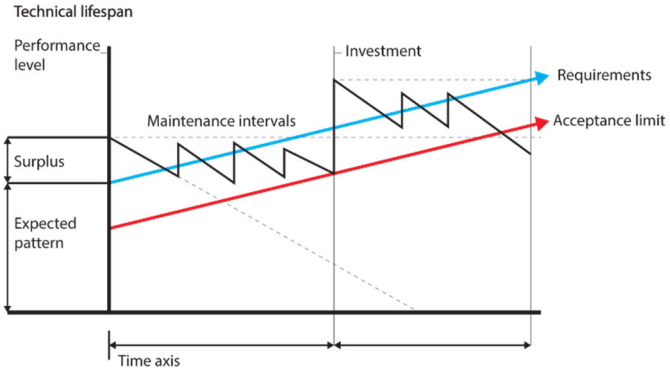


Figure 15: depiction of technical lifespan adapted from van Vliet et al. (2004)

The requirements of the owner and user when it comes to the technical quality of the building also increase continually, as well as the acceptance level, as can be seen in Figure 15 (van Vliet et al., 2004). The degree to which the property owner is willing to invest in the property depends on functional and exploitative conditions.

In the case of office buildings, the functional and economic lifespan is generally reached sooner than the technical lifespan (Gan, 2014). However, requirements imposed by the government can also have an impact on the technical lifespan of office buildings. The Dutch government aims to transform the built environment into energy neutral and, because of this goal, has stipulated that all newly built buildings from 2020 should be energy neutral, but also from 2023, only office buildings with an energy label C or better are allowed to be in use (except for monumental buildings and office buildings smaller than 100 m²) and in 2030 all office buildings must have an energy label A. This means a maximum of 225 kWh per m² per year of primary fossil energy use (Rijksdienst voor Ondernemend Nederland,

2018). In the Netherlands, there are, according to the Rijksdienst voor Ondernemend Nederland (2021), approximately 65.000 office buildings which still have to comply with the C label requirement. According to the label registry, 40% of buildings have an energy label of C or higher, and 12% have a label of D or worse. No label has been registered for the resulting 48% of office buildings. However, the expectation is that 60% do not comply with the requirement. Buildings which cannot comply with this expectation will be pushed out of the market, increasing the demand for newly built (Expertteam Vastgoedtransformatie, 2022). Building owners must provide an energy label to a potential buyer or party looking to rent or buy the building. The economic lifespan of these buildings is shortened without further investments as building owners would not be allowed to enter new contracts or renew contracts without upgrading. Energy labels are not the only way buildings' energy performance is measured. Next to energy labels are several other sustainable certifications, such as the MVO Performance Ladder, CO2-Performance Ladder, Ecolabel, ISO 50001, BREEAM and Energy Star. Although these certifications are not required, they have a commercial benefit as building owners can demonstrate that they invest in sustainability. Receiving subsidies is also easier if a building has a certificate such as BREEAM.

Energy label C by 2023 and A by 2030

Energy labels indicate how energy efficient a building is by assigning a letter ranging from A to G- the latter being the least energy efficient. Thus, energy label C indicates that the building is relatively energy efficient. Energy labels are calculated based on the characteristics of the building (e.g., thermal insulation, HVAC system and lighting). First, the energy performance coefficient (energieprestatiecoëfficiënt (EPC) in Dutch) is calculated, and this number is afterwards divided by the legally required performance to determine the energy index (EI). The range in which the resulting energy index falls determines the energy label of the building. A utility building (e.g., offices, hospitals, schools) is awarded a label C if its EI-score is between 1,16 and 1,30 (table below) (Vattenfall, n.d.).

Table 6: Example of the relation between energy labels and the range of EI limit values for utility buildings such as stores, office buildings and hospitals (Vattenfall, n.d.)

Energy label for utility buildings			
Energy label	Limit value Energy-Index (EI)	Energy label	Limit value Energy-Index (EI)
A++	≤0,50	D	1,31-1,45
A+	0,51-0,70	E	1,46-1,60
A	0,71-1,05	F	1,61-1,75
B	1,06-1,15	G	>1,75
C	1,16-1,30		

Coping strategies

Remøy and van der Voordt (2007) state that vacancy influences many levels. Firstly, they state that the owner of the building is financially affected by vacancy; on a social level, vacancy ensures problems of insecurity and social uncertainty and may cause criminality (e.g., vandalism, break-ins, or illegal occupancy). Furthermore, vacancy also has an indirect effect because of the negative image given to the surrounding area. It can potentially lead to deterioration of the area, technical decay and devaluation of the buildings (Remøy & van der Voordt, 2007). Property owners dealing with a vacancy can execute different strategies for coping with the negative consequences (Remøy, 2010):

Consolidation

Consolidation refers to not actively doing anything to the building. This strategy manifests in building owners searching for new tenants or selling the property. For the stock of buildings looked at for this thesis, office buildings with an energy label lower than c, this strategy would mean maintaining a building on the books that cannot be rented out to a new tenant. Alternatively, two other temporary

strategies can be applied preceding renovation, demolition, or transformation. Firstly, the building can be mothballed, which refers to temporarily closing the building to protect it from vandalism and decay caused by nature. Secondly, the building owner can allow the use of anti-squat.

Renovation or upgrading
Alternatively, the building owner can also choose to invest in the building through renovation or adaptation in such a manner that the building meets the needs of future tenants. A distinction can be made between more minor structural renovations and extensive renovations aimed at bridging the mismatch between the supply and the demand of users.

Demolishment and new construction
Lastly, the building owner can also choose to demolish the building to make space for a new building that can better fit future users' needs.

Transformation
Lastly, the building owner can transform the building into another function if the future market value of the new function is higher than that of an office building. Adaptive reuse is “a process that retains as much as possible of the original building while upgrading the performance to suit modern standards and changing user requirements” (Bullen, 2007, pp. 21-22). Alternatively, it is "a process that changes a disused or ineffective item into a new item that can be used for a different purpose” (Bullen, 2007, pp. 21-22). Adaptive reuse is based on a life cycle perspective of dealing with real estate. The traditional way of viewing a building's life cycle and building process is linear and typically consists of the following stages: initiative, feasibility analysis, briefing, design, construction, operation and, use and demolition (Blakstad, 2001). Blakstad (2001) presents a cyclical building process in which the building is constructed during the initial phases. This is followed by the use and operation phase, with a period in between in which adaptations are considered and take place (e.g., new programming). The process also depicts the situation in which the building is deemed obsolete after an assessment, after which the building can either be demolished or fully adapted (Figure 16).

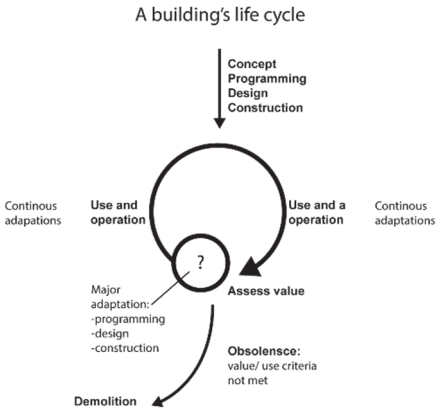


Figure 16: The cyclical building process adapted from Blakstad (2001)

1.9 The transformation potential

The Conversion Potential Assessment Tool, also called the Conversion Meter (Geraedts et al., 2017), will be used for this research. Below, a summary of the most essential criteria in the Conversion Meter and the operationalisation of these criteria can be found.

Table 7: Conversion Meter Process (Geraedts et al., 2017)

Step	Action	Level	Outcome
Step 0	Inventory market supply of unoccupied offices	Stock	Location of unoccupied offices
Step 1	Quick scan, initial appraisal of unoccupied offices using veto criteria	Location Building	Selection or rejection of offices for further study; Go No / Go decision
Step 2	Feasibility scan: further appraisal using gradual criteria	Location Building	Judgement about the transformation potential of office buildings
Step 3	Determination of transformation class	Location Building	Indicates transformation potential on a 5-point scale from excellent to not transformable
Further analysis (optional and may be performed in reverse order if so desired):			
Step 4	Financial feasibility scan using design	Building	Indicates financial/economic feasibility Sketch and cost-benefit analysis; Go / No Go decision
Step 5	Risk assessment checklist	Location Building	Highlights areas of concern in transformation plan; Go / No Go decision

The Conversion Meter seen above was last updated in 2017. A revision of the tool will first be executed. This is done for a few reasons. Firstly, the primary function of the Conversion Meter is to provide a sieve through which buildings can be analysed and consequently filtered out, leaving the most suitable buildings for transformation over. This sieve has different criteria, some seen as veto criteria, and some as gradual criteria. However, some of the presuppositions underlying these criteria might not be current. Furthermore, the criteria have also been updated because of interviews held with developers at Van Wijnen. Elements which were updated are mentioned in the paragraphs below and in Introduction part 1. One element interwoven in all three steps of the Conversion Meter is the impact of the Dutch building code on the veto and gradual criteria.

Step 0: Inventory market supply of unoccupied offices

The Conversion Meter is a tool applied to an inventory of buildings. This inventory can be selected at different scales- a city level (e.g., in the case of this thesis, the city of The Hague was selected). Alternatively, an inventory of supply can also be selected on a district or portfolio level. This inventory should contain buildings that have been vacant for a long time or are expected to become vacant in the foreseeable future. The chapter above mentioned which filters were applied to come to a stock of buildings.

Step 1: Quick scan, initial appraisal of unoccupied offices using veto criteria

Once an inventory has been selected, the buildings can be examined based on several Veto criteria, which form a quick initial appraisal of the conversion potential. The veto criteria must be satisfied (meaning the assessment must be a" Yes"); otherwise, the building is excluded from the inventory as it is deemed unsuitable for conversion to residential function. This QuickScan is divided into four categories (market, stakeholders, location, and building). The different tables of the Conversion Meter can be found in Appendix F.

Veto criteria on the market level

This first step starts with analysing the demand in The Hague. As mentioned previously, the demand for housing in the Netherlands is high; however, during this step, the demand for housing in the Hague will be zoomed in on, focusing on which target groups are most in need. Different target groups can be distinguished, and these target groups can have different demands regarding the type of dwelling, dwelling size, affordability, level of attractiveness and safety of the living environment. The differences

are tightly linked to the age, life phase, household composition and financial capability. The table below displays five demand profiles based on differences in housing needs and preferences.

Table 8: Five demand profiles for inner-city redevelopment projects (Geraedts et al., 2017)

Target group 1: starters Group living	Target group 2: starters Semi-independent living	Target group 3: young two-earners	Target group 4: seniors 55+ Low to modal income	Target group 5: seniors 55+ Above-modal income
Location (residential area)				
1. Urban environment, plethora of facilities	1. Urban environment, plethora of facilities	1. Urban environment, a plethora of facilities. 2. Suburban living environment (green and spacious) 3. Easily accessible by car 4. Good parking facilities	1. Safe living environment (social safety) 2. Stores for daily shopping and public transportation within walking distance (<500m) 3. Preference for urban environment 4. Suburban living environment (green and spacious)	1. Safe living environment (social safety) 2. Shops, green, public service office spaces, and public transportation within walking distance (<500m) 3. Easily accessible by car 4. Good parking facilities 5. Partly urban, partly suburban environment
Building (dwellings)				
2. Unit for 3-7 residents 3. Livingroom, bedroom approximately 22m² 4. Common/shared bathroom 5. Common/shared kitchen 6. Common/shared outdoor space (1,5m²/unit) 7. Common/shared bicycle shed 8. Common/shared laundry room 9. Total 50m², area of use 35m²	2. Semi-independent unit with shared facilities 3. Livingroom, bedroom approximately 22m² 4. Bathroom per 2 people 5. Kitchen per 2 people 6. Common/shared outdoor space (1,5m²/unit) 7. Common/shared bicycle shed 8. Common/shared laundry room 9. Total 50m², area of use 35m²	5. Large luxury apartments 6. Private outdoor space	5. Preferably, no dwelling on the ground floor 6. Lift available 7. Preferably no interior staircase 8. At least 3-room apartment 9. Living room 25-30m²; bedroom >11,5m² 10. Direct relationship between Living room, bedroom, and bathroom 11. Extra attention to soundproofing 12. Adaptable in case of disability	6. Preferably, no dwelling on the ground floor 7. Lift available 8. Preferably no interior staircase 9. Vertical core for internal circulation. No corridor access 10. 4-5 room apartment 11. Living room 30-40m²; large kitchen 12. Direct relationship between Living room, bedroom, and bathroom 13. Spacious bathroom 14. Balcony or roof terrace 10-15m² 15. Extra attention to soundproofing 16. Adaptable in case of disability

Stakeholders in transformation

Below is a summary of the stakeholders involved in the transformation of buildings. The adaptive reuse process involves many actors, which can impact the transformation of the building (Arfa et al., 2022). The primary actors within this process can be divided into direct or indirect agents (Kurul, 2003). Direct agents are formed by the parties who are directly involved in the progression of the project, meaning that these parties are responsible for the initiation, design, and execution of the development. On the other hand, indirect agents are formed by the parties who indirectly impact the project's development through statutory systems.

Office buildings are typically owned and managed by (1) commercial real estate investors or private owners. These parties are typically only interested in the building's exploitation, management, and use according to its original function. These parties, therefore, rarely participate in transformation. On the other hand, (2) housing associations and investors are active drivers of transformation projects. Transformation projects are interesting for this actor as their main target groups consist of low-income youngsters who do not have children who wish to live in city centres. The (3) real estate developers have the knowledge and experience to realise the transformation. Developers are interested in these projects as it is difficult to find land in central urban areas, and the buildings are often situated centrally in cities. Simultaneously, the financial benefits of providing dwellings in central urban areas are high for developers. There are different kinds of developers. Transformation projects in the past

have been popular for contractor developers as the expertise of the constructors, and that of the developers are merged early on during the process. Fitting a new layout in the existing framework and testing its feasibility are the jobs of the (4) architect in the initial phases. This is often done in collaboration with the developer. Public authorities (5) are indirect actors formed by the Netherlands' local municipality and the national government. The municipalities take on a facilitating role. The municipality is responsible, for example, for assessing if a project adheres to the zoning plan and updating the zoning plan if necessary. Lastly, the municipality is also responsible for checking if the construction plans align with the building decree and giving out building permits.

Veto criteria on location level

Furthermore, spatial developments are only allowed in the Netherlands if the plan presented to the municipality is deemed suitable based on several environmental requirements. Those quality standards are discussed below.

Air quality standards

The most critical constraints regarding air quality are written in the Wet Milieubeheer and are based on European guidelines. The most critical substances regulated within this legislation are particulate matter (PM10 and PM².5) and nitrogen dioxide (NO2) (Rijkswaterstaat, N.D.).

Noise pollution

The function of housing is considered by law a noise-sensitive function. It is, therefore, subject to protection from noise pollution (e.g., road traffic, railroad noise and industrial noise with the exemption of roads for which a speed limit of 30 km per hour applies) under the Wet Geluidhinder (Wgh). Within this act, a differentiation is made between urban or suburban areas and the amount of traffic lanes. Therefore, in an urban area, there is a noise zone of 200 meters surrounding a road with 1 to 2 traffic lanes and a noise zone of 350 meters surrounding a road with three or more traffic lanes. In a suburban area, there is a noise zone of 250 meters surrounding a road with 1 to 2 traffic lanes, a noise zone of 400 meters surrounding a road with three or more traffic lanes and a noise zone of 600 meters surrounding a road with five or more traffic lanes.

External safety

External safety is also a relevant factor which should be looked at in each area as it provides information on the risks due to the storage, production, and transportation of hazardous materials and the operation of wind turbines and airports (objective 1) and the protection of the society from disruptive events such as a disaster with many victims (objective 2). The external safety policy creates a spatial separation between vulnerable and limited vulnerable objects and risk sources. These distances are based on the expected effects in case of a calamity. Vulnerable objects (e.g., housing) receive the highest degree of protection through a limit value, which must be followed. A distinction is also made between site-specific risks and group risks. The site-specific risk indicates the probability per year that a person dies at a location as a direct consequence of an accident at the risk source. The norm for a site-specific risk is the probability of 10^6. This is the limit for a vulnerable object; this probability is a guideline for a limited, vulnerable object. The group risks are geared towards the second objective of external safety policies and indicate the probability of an accident involving ten or more fatalities near a risk source. Thus, the group risk is, for example, geared at managing area

population density. There are no limit values for the group risk. However, there are orientation values, and, in some cases, the local authority must justify the group risk *(Rijkswaterstaat, N.D.).*

Soil pollution

To realise housing, the quality of the soil must be sufficiently good, which means that the quality of the soil- because of the existing soil contamination- must not pose an unacceptable risk to the health of the soil users. The function of the soil determines to which extent its users encounter the possible contamination. If the soil is contaminated, the soil must either be cleansed or removed, which is costly.

Veto criteria on a building level and the Building Code 2012

The building regulations for newly built and existing buildings regarding safety, health, usability, energy efficiency and the environment are written down in the Building Code 2012 (Het Bouwbesluit 2012 in Dutch). These (primarily technical) regulations form the minimum requirement for the built environment. The regulations for new building and reconstruction are based on 12 distinguished functions. Because the function of the building is changed through transformations, the regulations which are in effect for the reconstruction of the building are the regulations for the new function. The municipality is responsible for enforcing the building regulations. It does this by monitoring adherence to the regulations from the start of the permit application process to the structure's completion (Ministerie van Binnenlandse Zaken en Koninkrijksrelaties, 2012). The version of the building code currently in effect was published in 2012 and forms the third version of the building code. The first building code was enacted in 1992, ensuring uniformity across the Netherlands regarding technical building standards. Predating this, each municipality was responsible for its building regulations. The 1992 Building Code was updated in 2003, resulting in the 2003 Building Code. The 2003 Building Code was updated again in 2012. By January 1, 2024, the Besluit Bouwwerken Leefomgeving (Bbl) will replace the Building Code. Furthermore, the 2012 Building Code will no longer be in effect due to the introduction of the "Omgevingswet",- which has been called into effect to simplify and merge the regulations for spatial development.

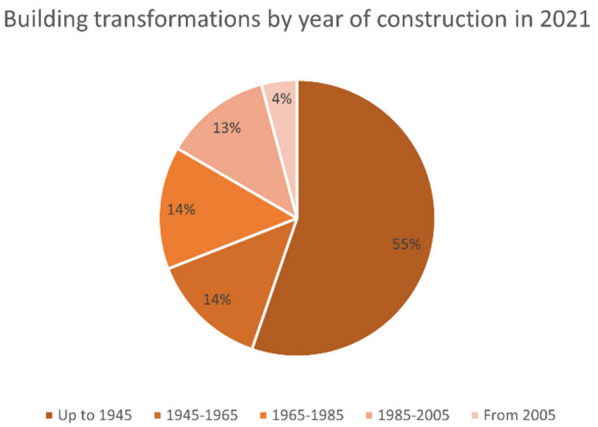


Figure 17: Building transformations by year of construction in 2021 (Centraal Bureau voor de Statistiek, 2023b)

Most buildings which have been transformed in 2021 were built before 1945 (Figure 17)- and this trend has been stable across the years- meaning that most transformed buildings were constructed before the 1992 Building Code went into effect (Centraal Bureau voor de Statistiek, 2023b). Before the 2012 Building Code, upgraded buildings had to conform to the newly built regulations after reconstruction. However, this is because the principle of legally attained level (Rechtens verkregen

niveau in Dutch) is no longer the case. The 2012 Building Code distinguishes between three levels of quality: firstly, the newly built level; secondly, the level of existing construction; and thirdly, the legally attained level. Within this distinction, the new-built regulations are the strictest, and the regulation for the existing construction provides the minimum level a building must meet at any given point. The legally attained level is situated between these two levels of quality and is formed by the current quality level of a building (Figure 18). The principle adhered to is that the current quality of the structure is not allowed to be worse than when it was initially approved by the municipality and constructed (e.g., thermal insulation value). Thus, the current quality of the structure is reflected in the original permits granted for the initial construction in combination with permits for subsequent renovations. This means that the parts of the building that are physically altered must adhere to reconstruction requirements; however, the parts of the building that remain untouched only need to meet the requirements for existing construction. The new-built standards form the upper limit of the legally attained level, while the standards for existing structures form the lower limit. The older the building, the more significant this difference is since the new-built standards are updated and made stricter with time. This principle aims to spare the building owner from making costly investments to upgrade the building to newly built standards (Rijksdienst voor Ondernemend Nederland, 2014).

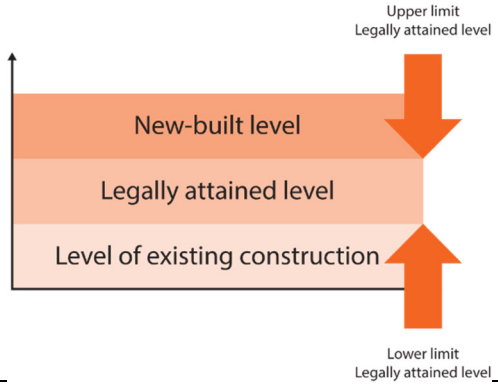


Figure 18: The principle of legally attained level concerning new-built standards and standards for existing buildings (own image)

Situation 1: The current quality level is lower than the standard for existing buildings for the new function → the reconstruction must be executed so that the building adheres to the standards for existing buildings for the new function (lower limit legally attained level).	Situation 2: The current quality level is higher than the newly built level for the new function (e.g., transformation hotel to housing) → In such an instance, the upper limit of the legally attained level applies and is equal to the standards for newly built for the new function.	Situation 3: A new facility is constructed, meaning there was no previous level of quality (e.g., a new bathroom is added). In such an instance, the new facility must meet at least the lower limit of the legally attained level, which, in this case, is equal to the standards for existing buildings.

The Conversion Meter contains several regulations which stem from the Building Codes. These are technical factors which impact the building and location level. Therefore, the 2012 building code was checked to see whether these criteria were current.

Minimum ceiling height

In the Building Code 2012, it is stated that the height above the floor of a living area must be at least 2.1 meters for existing structures. However, the free ceiling height for new buildings is 2.6 meters (Ministerie van Binnenlandse Zaken en Koninkrijksrelaties, 2012).

Structural safety and dilapidation

Firstly, the building code states that a structure must be sufficiently resistant to the loads affecting it to prevent failure during its intended use period. For new buildings, this period is 50 years; however, for existing structures, this is not the case. The principles of assessing the structural safety of an existing structure are contained in the NEN8700 (Ministerie van Binnenlandse Zaken en Koninkrijksrelaties, 2012). Next, an existing structure is not allowed to be used if the competent authority has notified that the use of the building is dangerous due to its proximity to a dilapidated structure.

Fire safety and escape routes

Next to structural safety, fire safety is also an important safety factor for buildings. An existing structure should be vacated and searched in case of a fire without danger of collapse. In determining the stability of the structure, extraordinary load combinations that may occur in the event of a fire are used, as prescribed in the NEN 8700. The duration of the collapse is determined by NEN 6069.

Furthermore, there are more standards on fire safety, such as a floor, stairway, or ramp in a sub-compartment, which is part of a protected route, is not allowed to collapse within 20 minutes if a fire occurs in the sub-compartment. Suppose a fire breaks out in a fire compartment. In that case, a building structure outside of that fire compartment is not allowed to fail within the time specified in the table below because of the failure of a building structure within or adjacent to the fire compartment in question.

Duration of the fire resistance concerning the collapse in minutes for a residential building	
In the case that the floor of a residential area is higher than 7 meters and not higher than 13 meters above the measurement level	30
In the case that the floor of a residential area is higher than 13 meters above the measurement level	60

Furthermore, an enclosed space must be in a fire compartment, except toilets, showers, a lift, and technical rooms with a usable area not exceeding 100 m^2 which is not intended for one or more combustion appliances with a total rated load exceeding 160kw- this technical room is a fire compartment on its own. A fire compartment has a usable floor area that is not bigger than 2000m^2.

All existing structures must have an escape route which allows users of the structure to reach a safe place in case of fire. In this case, this means that the walking distance between a sub-fire compartment (such as an apartment) and an (emergency) staircase entrance is not allowed to be longer than 45m.

Hazardous materials

As asbestos fibres are hazardous to humans, the concentration of these fibres in a room accessible to people in an existing structure cannot exceed 2,000 fibres/m^3 (in compliance with NEN 2991). Furthermore, the formaldehyde concentration in a room accessible to people in an existing structure cannot exceed 120 µg/m^3 (in compliance with NEN-EN-ISO 16,000-2).

Step 2a: Feasibility scan using gradual criteria at the location level

The Conversion Meter assesses the feasibility of the building on a location level because the location of a building must be aligned with the demands of the new target group. Typically, buildings located in central urban areas, in (or on the edges) of housing areas, are deemed more suitable to transform compared to buildings located, for example, in office parks. To transform the buildings found in the latter location, urban redevelopment is necessary (Remøy, 2010). Furthermore, the feasibility is assessed using different aspects, namely, (1) the functional, (2) cultural and (3) legal aspects. The building type often determines which factors weigh the heaviest. For listed buildings, the cultural-historical aspects are a driver for transformation. However, most office buildings are not listed or considered valuable for historical reasons. Regarding office buildings, the economic, technical, legal, and functional aspects weigh heavier. The different tables of the Conversion Meter can be found in Appendix F.

Good daylight/sunlight possibilities and a good view from the building

Some of the gradual criteria are geared towards providing dwellings that add to the quality of life of their users. The requirements regarding suitable daylight are noted in Chapter 3 of the Dutch building codes. These requirements are geared toward protecting the health of users of buildings, especially for working and living, as the users spend prolonged periods in these rooms. Access to daylight is essential for residential or health care functions. Next to that, sufficient daylight also has benefits regarding the energy consumption of the building as fewer lights need to be turned on. During winter, the sunlight also helps to heat the rooms, decreasing the heating demand. The presence of windows also adds a pleasant experience for the users of the space as the window provides a viewpoint into the outside world (Bosch, 2015). For newly built buildings, it is expected that the equivalent daylight area in the external partition construction is equal to 10% of the floor surface in m². Next to that, the equivalent daylight surface is also required to be at least greater than 0,5 m². New-built office buildings are held to a different standard, meaning the equivalent daylight area in the external partition construction must be equal to 2,5% of the floor surface in m², and the equivalent daylight surface must be at least greater than 0,5 m² (Bosch, 2015).

A good view from the building is typically judged if at least 75% of the floor space regularly used has a direct line of sight to the outside of the building through clear glass. Next to that, other metrics for a good view from the building are, for example, the presence of lines of sight in two different directions. Next, viewing fauna, flora, the sky, movement outside, and objects in the distance also add value to the building.

Suitability of the area and distance and quality of facilities

The office building firstly needs to be in a suitable area to realise housing. This would mean that buildings typically in monofunctional locations or remote industrial areas are not deemed suitable. In such cases, area development is also necessary. The relevant aspects on the demand side of residential accommodation also shift through time. Below are the primary alterations to the table, consisting of an update of the facilities that are expected to be near housing projects and the acceptable walking distances to reach these facilities. Geraedts et al. (2017) provide a table with relevant aspects which are consequently embedded in the Conversion Meter (figure below). However, not all these facilities are equally relevant nowadays. To illustrate, the proximity to banks and post offices, due to cultural

shifts and digitisation, is no longer as important as it was a few decades ago[1]-except for target groups such as the elderly. Thus, these gradual criteria have been removed from the Conversion Meter.

Table 9: relevant aspects for transforming into housing (Geraedts et al., 2017)

Location (housing environment)	Building (residential)	
1. Atmosphere a. Nature of the built environment b. Social image c. Liveliness d. Available green space 2. Facilities a. Shops b. Restaurants/ bars c. Schools d. Medical facilities e. Recreative facilities 3. Accessibility public transport a. Distance to bus/tram stop b. Frequency and times c. Distance to train/underground 4. Accessibility by car a. Distance to motorway b. Congestion level c. Parking facilities	1. Dwelling type 2. Access 3. Dwelling size a. Number of rooms b. Living room c. Kitchen d. Bedrooms e. Sanitary facilities f. Storage space 4. Arrangement of dwelling 5. Level of facilities 6. Outside space (e.g., garden) 7. View from dwelling, privacy 8. Environmental aspects a. Heating b. Ventilation c. Noise d. Exposure to sun/ daylight e. Energy consumption. f. Materials used	9. General conditions a. Accessibility b. Safety c. Flexibility d. Adequate management 10. Costs a. Purchase price/ rent b. Other costs

The distance to relevant facilities and the quality of facilities in each area are also essential to transform a building into housing. The area must have facilities which support the daily necessities of its residents. This is especially important as different target groups have different needs. For this thesis, the acceptable walking distances from one's home to different facilities produced by Crow have been used. These distances can be seen below. Crow is a knowledge platform that develops knowledge about infrastructure and mobility in the built environment and provides guidelines and manuals on relevant subjects.

Table 10: Overview of acceptable walking distances from home (Geraedts et al., 2017; Kennisplatform CROW, 2021)

Relocation from home to	Acceptable distance	Relocation from home to	Acceptable distance
Parked car	100-200 meters	Work location	250-1000 meters
Parked shared car	100-350 meters	School location	250-900 meters
Parking space with charging station	100-200 meters	Hospitality	500-1000 meters
Mailbox	150-450 meters	Doctor/ physio/pharmacy	450-1000 meters
Dumpster	50-150 meters	Hospital	450-1000 meters
Bus stop (local bus)	200-500 meters	Cinema/theatre	450-1000 meters
Bus stop (long-distance bus)	250-900 meters	Indoor sports venue	300-800 meters
Supermarket/ Shop for daily necessities	450-1000 meters	Outdoor sports venue	400-900 meters
City centre/ shopping area	500-1500 meters	Neighbourhood meeting places (square, park)	<500 meters

1 B. Eekels, personal communication, June 15, 2023

Accessibility

Accessibility of an area can be defined and measured in multiple ways depending on the perspective (e.g., from the individuals' point of view, Ov), the activity (recreation, living), the reason for travelling (visitors, social), the target group (specific target groups car owners), mode of transportation (walking, biking, public transport, car) and the scale used for analysis (neighbourhood level, region, country) (Hoogendoorn-Lanser et al., 2011). Four components are deemed necessary for accessibility, namely, transport (meaning resistance faced when travelling towards a destination and can be expressed in terms of time, cost, and effort), spatial (reflects the spatial distribution of the activity), temporal (reflects the availability of destinations throughout the day and the times individuals participate in travelling) and individual (reflects the individual's needs, capacities, and abilities). For this analysis, accessibility by public transport and car is essential.

The Conversion Meter applies an infrastructure-oriented approach in which an analysis of how well various transportation networks connect to a particular area will be analysed. Regarding public transport, the distance from a residential location to the nearest bus, tram, or metro stop is relevant. Guidelines for such distances have been developed based on the type of living environment (table below) (Hoogendoorn-Lanser et al., 2011). A maximum distance of 500 meters to the nearest bus or tram stop is used for a city like the Hague. For metro stops, a maximum distance of 1000 meters is used; for smaller train stations, a maximum distance of 2000 meters is used; for main train stations, a maximum distance of 5000 meters is used (van der Blij et al., 2010). Four categories are chosen for each of these maximum distances to analyse if the distance to the tram, bus, metro, or train stations is suitable (table below).

Table 11: scale for distances used to bus, tram, metro, train stations and parking (Hoogendoorn-Lanser et al., 2011; van der Blij et al., 2010)

Accessibility	Bus and tram	Metro	Intermediate Train station	Main Train station	Parking
Good	0-100m	0-250m	0-500m	0-1000m	0-100m
Fair	100-250m	250-500m	500-1250m	1000-2500m	100-150m
Moderate	250-500m	500-750m	1250-2000m	2500-5000m	150-200m
Bad	>500m	>1000m	>2000m	> 5000m	>200m

The accessibility of cars can be operationalised by looking at the distance from the building to the nearest ramp up the highway (Hoogendoorn-Lanser et al., 2011). Car owners report being less pleased if they walk longer than 2 minutes to their car. Therefore, the acceptable walking distance from home to the car is between 100 and 200 meters (Kennisplatform CROW, 2021).

Representative impression

This criterion is related to the fitness of the location according to the demands of the potential target group (e.g., senior citizens wish to live centrally). There are six criteria named in this section in the Conversion Meter. Firstly, the location should be situated centrally and not near highways. Secondly, there should be other buildings present in the vicinity. The neighbourhood should be lively, and the environment in the neighbourhood should be green. Next to that, the area should have a good reputation, and lastly, the area should have good air quality and little noise hindrance. Spatial planning principles have been created for the Haaglanden, depicting the different living environments in different city areas, including The Hague. This arrangement consists of 5 primary living environments,

further subdivided into 13 living environments, as seen in the table below (SmartCityStudio & Eyckveld, 2015).

Table 12: Classification of 5 residential environments and neighbourhoods in The Hague (SmartCityStudio & Eyckveld, 2015)

Classification of 5 residential environments			Example of neighbourhoods in The Hague
1	Metropolitan	1. Centre	Wijnhavenkwartier
		2. Thematic	Scheveningen Strand, Beatrixkwartier, Laakhaven
2	Urban	3. Vibrant	Stationsbuurt, Zeeheldenkwartier, Regentessekwartier
		4. New	Zuid-West, Mariahoeve
		5. Quiet	Rustenburg en Oostbroek, Bomenbuurt
		6. Exclusive	Statenkwartier, Van Stolkpark
3	Suburban	7. Stacked	Houtwijk Den Haag
		8. Grounded	Ypenburg Wateringseveld
		9. Exclusive	Vroondaal, Vogelwijk
4	Village	10. Centre-village	-
		11. Local	-
		12. Suburban	-
5	Rural		Uithofpolder

Step 2b: Feasibility scan using gradual criteria at the building level

In step 2b, the feasibility of the building on a building level is assessed. This is done given that each building has its own unique set of characteristics which might add value in the transformation process or pose a risk. For example, since people spend prolonged periods in their dwellings, the presence of windows which provide sufficient daylight is imperative. Alternatively, building styles and codes change over time, determining the practicality of transforming certain buildings. To illustrate, it is expected to find thermal bridges in buildings designed and built in the 60s and 70s. It is expected to find hazardous materials (e.g., asbestos) in buildings built before 1994, although this is no longer allowed nowadays.

Like step 2a, the feasibility is assessed using different aspects, namely, (1) the functional, (2) cultural, (3) technical and (4) legal aspects. The table below displays the different gradual criteria. Some of these criteria have been altered. The different tables of the Conversion Meter can be found in Appendix F.

Capacity of the building

It is firstly suggested that buildings must be more than three years old or last renovated longer than three years ago. A building owner will want to refrain from reinvesting money to transform a recently constructed building. The year of construction of the buildings can be found in the Database of Vastgoeddata.nl. The Conversion Meter considers buildings that are entirely vacant and have been vacant for longer than three years. However, for this research, this criterion is deviated from as the focus is laid on office buildings which are not allowed to be rented out for their current function anymore without some form of intervention- increasing the odds of them becoming vacant.

The floor space of the building should be large enough to realise sufficient housing to make the project feasible. The Conversion Meter deems ≥1000m² of floor space sufficient as this can be translated into 20 single-person units of 50m². However, the minimum capacity required is dependent on the type of developer/investor. As this thesis focuses on delivering a quantity of dwellings, this amount is deemed too small. Most buildings transformed have a minimum size of 500 m² up to 5000 m², and buildings

larger than 5000 m² are rarely transformed (Centraal Bureau voor de Statistiek, 2020b). For this thesis, a minimum building size of 3000m² is chosen to deliver approximately 100 single-person units of 50m².

Possibility of extensions

Transforming a building without making additions or removing any volume is a common strategy; however, for housing, it offers few opportunities (e.g., only being able to realise housing for students or the elderly)(Houben, 2014). Office buildings can often be extended without issues, or floors can be added on top of the building, which adds to the project's financial feasibility as adding more units lowers the land cost per unit. The project yields more in theory as more dwellings can be sold or rented afterwards (Gelinck, 2007). This is because office buildings are designed to carry a much higher load than what is expected of housing. Next, combining housing with other commercial functions on the plinth of the buildings is also seen as an effective means of increasing the project's viability (van der Voordt, 2006). Extra square meters can be added to buildings in numerous ways, as seen in the table below (Straub, 2001). Furthermore, the gradual criteria" possibility for constructing basement"- present in the 2017 version of the Conversion Meter- has been removed. If a to-be-transformed building has a basement, the basement is seen as an added value and will be reused in the transformation; however, extending a building by adding a basement where one does not already exist is hardly ever done in practice.

Table 13: Different ways the volume of the building can be edited (Houben, 2014; Straub, 2001)

Types of edits possible	
Merging or splitting	The housing differentiation within the existing building is altered
Topping up	Additional floor space is added on top of the building by topping up.
Additions	Like topping up, however, volume is added either to the front, rear, or side of the building. This goal is to add extra square meters for things like balconies, corridors or extending the dwellings. Alternatively, this method can also be applied to reduce the area of the façade by filling "coves" in the façade (e.g., adding atriums, winter garden).
Plinth extension	Extending the plinth, units on the ground floor are transformed into dwellings and potentially merged to form larger units with dwellings on the first floor. Alternatively, units in the plinth are rented out to commercial parties.
Capping	By capping one or more floors are demolished

Technical condition of the building

The Conversion Meter presents several gradual criteria regarding dimensions and technical properties conducive to transformation. These criteria pertain to the maximum depth of the building, the grid support structure, the maximum height dimension between floors, the condition of the support structure, the possible connection of inner walls on the grid, the presence of windows or façade openings which can be reused and the presence of sufficient service ducts. These criteria were discussed, and some have been altered (see Technical requirements on a building level).

Step 3: Determination of transformation class

Below follows an oversight of the transformation class per building because of filling in the feasibility scan using gradual criteria at a building and location level. Different weighing factors can be assigned for the analysis on a location level (default weighing score is 5) and on the building level (default weighing score is 3). It is generally accepted that the location factors weigh heavier than the building characteristics; however, these weighing scores can also be altered. The transformation class is divided into the following five categories:

1. Class 1: No transformation potential

2. Class 2: Hardly any transformation potential

3. Class 3: Limited transformation potential

4. Class 4: High transformation potential

5. Class 5: Excellent transformation potential

It is also important to note that the value of the Conversion Meter lies in comparing different buildings with one another based on a set of predetermined criteria to prove the suitability of one over the other. Thus, although this is expressed in a numerical value, this score should be taken with a grain of salt. The feasibility of buildings which score in classes 4 and 5 can be further analysed, although that is outside the scope of this research. The different tables of the Conversion Meter can be found in Appendix F.

Figure 19: Transformation of DC Van Hal in Amsterdam in which an office building from 1964 was transformed into studios for graduates and students and creative workspaces (Tijhuis, N.D.)

Introduction part 1

The main question being answered in this first is as follows: What makes a building suitable for transformation to residential function? As mentioned above, the transformation potential is measured using a tool previously developed at the TU Delft called the Conversion Meter. This tool was firstly reviewed through interviews held with developers, applied to a selection of buildings and after the analysis once more reviewed through interviews held with an expert panel. Below follows a summary of the feedback received. An overview of the tables of the Conversion Meter can be found in Appendix F.

The majority of the feedback received relates to the reduction of the complexity of the transformation process to the normative and binary approach of the Conversion Meter. Actors involved in transformation projects can have different approaches and visions to transformation. To illustrate a few, some parties predominantly focus on transforming monuments. Target groups which urgently require housing are less picky regarding the location of the building (e.g., status holders). Whilst topping up is possible in dense city centres, horizontal extensions are often impossible due to a lack of space. A building does not have to be vacant to be transformed, and having tenants while the design process is ongoing also has financial benefits. The required capacity of the building is highly dependent on the investor/developer as this relates to the number of units which can be sold or rented. It is impossible to reduce these different approaches into one universal standard. However, understanding which criteria are essential for which actors and why is vital as one can then edit based on the needs of that actor (e.g., for some parties, a transformation project becomes interesting if, at a minimum, 70-80 units can be realised for others, this is not a requirement).

Veto criteria

The Building Code 2012 (BBL in 2024) requirements could also be veto criteria. For some requirements of the building codes, architectural solutions are available. To illustrate, a “deaf facade” can be built to combat noise nuisance. However, other elements, such as fire compartmentation and escape routes, are more crucial as the requirements for existing structures for residential function are often higher than the current quality of the building (Rijksdienst voor Ondernemend Nederland, 2014). Secondly, next to the zoning plan, the provincial ordinance can also impede housing development in certain areas. Lastly, the financial feasibility of the transformation project is also a veto criterion.

Car ownership, shared mobility, and parking norms

The role of cars in Dutch society cannot be understated; most people who own cars are between the ages of 30 and 50. Owning a car in rural areas is essential. However, the lack of parking spaces, the cost of parking and the provision of alternative commuting possibilities in highly urbanised areas have made shared cars more prevalent in larger cities. More than half of the people who share cars in the larger cities are between 31 and 50 years old, and less than 1/3 is younger than 30 (Jorritsma et al., 2021). Most people using car-sharing facilities are single, followed by couples with no children. In the Netherlands, most transformation projects are geared towards realising dwellings for students and starters in the larger cities, which generally fall in this age category (Expertteam Vastgoedtransformatie, 2022).

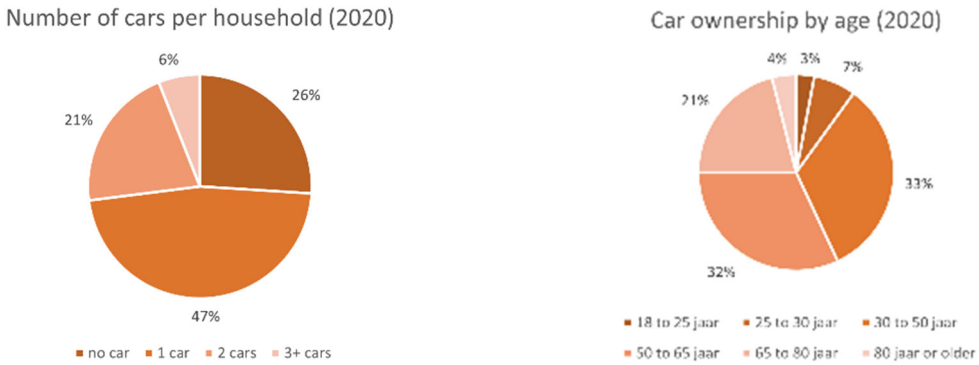


Figure 20: Number of cars per household in 2020 in The Netherlands and car ownership by age in 2020 in The Netherlands (Centraal Bureau voor de Statistiek, 2020a; Zijlstra et al., 2022)

Next, developers can negotiate to lower the parking norm with the municipality by providing shared car facilities[1]. This is done through a mobility correction (mobiliteitscorrectie in Dutch), which allows initiators to correct the parking requirement of permanent users if it is substantiated by handing in a mobility plan. The mobility plan explains what other mobility measures the developers aim to implement to ensure that the reduction in parking norms does not lead to parking nuisance.

Table 14: Example of reduction possible as a consequence of providing alternative mobility – random Dutch municipality (Overheid, 2022)

Area	Number of shared cars	Reduction of parking requirement
Public transport hub	One shared car per 20 dwellings	-20%
City centre		-10%
Envelope and rest of built environment		T.b.d.
Outskirts		T.b.d.

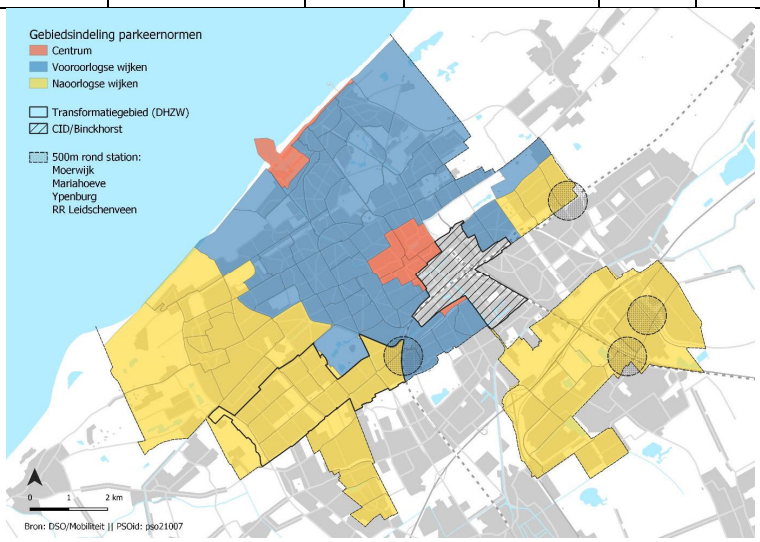
In The Hague, the pressure on parking has increased primarily in and directly around the city centre, whilst the city's outskirts have much less parking pressure (Municipality of The Hague, 2021a). Below is an indication of parking norms per office type (with or without reception), which can be divided into three city zones. It is the developer's responsibility to ensure sufficient parking for the building. Office buildings with a reception function have a higher parking norm than those without a reception, especially on the city's outskirts, which means that office buildings with a reception have larger parking facilities. Next, this table also shows the parking norm for different types of dwellings in The Hague, divided into three zones- the city centre, pre-war districts, and post-war districts.

Table 15:indication of parking norms for office buildings with and without reception as well as the parking norms for different types of dwellings based on three zones: the city centre, pre-war districts, and post-war districts in The Hague (Municipality of The Hague, 2021b)

Office building	**Unit**	**City centre**	**Pre-war districts**	**Post-war districts**	**Share Visit**
Without a reception	100m² g.f.a.	0,60	1,00	2,20	5%
With a reception	100m² g.f.a.	0,90	1,10	1,40	20%

Residential function	**City centre**			**Pre-war districts**			**Post-war districts**		
Type of dwelling	**Rent**	**Owned**	**Visitor**	**Rent**	**Owned**	**Visitor**	**Rent**	**Owned**	**Visitor**
Apartments									
<40m²	0,10	0,20	0,05	0,20	0,20	0,10	0,33	0,33	0,15
41-70m²	0,20	0,33	0,05	0,33	0,50	0,10	0,40	0,66	0,15
71-100m²	0,33	0,50	0,10	0,50	0,75	0,10	0,66	0,80	0,15
101-160m²	0,40	0,75	0,10	0,50	1,00	0,10	0,75	1,00	0,15
>161m²	0,50	1,00	0,10	1,00	1,00	0,10	1,00	1,00	0,15

Single-family dwellings									
<40m²	0,20	0,25	0,05	0,33	0,40	0,10	0,50	0,50	0,15
41-70m²	0,33	0,50	0,05	0,50	0,50	0,10	0,66	0,66	0,15
71-100m²	0,40	0,75	0,10	0,66	0,80	0,15	0,75	1,00	0,20
101-160m²	0,50	1,00	0,10	0,75	1,00	0,15	1,00	1,50	0,20
>161m²	0,60	1,00	0,10	0,75	1,00	0,15	1,00	2,00	0,20
Care-dwellings									
Care-dwelling ZZP 1-3	0,10		0,10	0,20		0,15	0,30		0,20
Care-dwelling ZZP 4-10	0		0,10	0		0,15	0		0,20
Student dwellings									
Student dwelling	0		0	0,05		0	0,1		0,05



Technical requirements on a building level

The Conversion Meter also includes several technical requirements for buildings which improve the transformation potential of the building (e.g., requirements on maximum building height and building depth). The main feedback received regarding the technical requirements that make a building suitable for transformation pertained binary judgement system implemented. Thus, understanding the logic behind some of these gradual criteria is more important for implementing during the analysis. When it comes to the maintenance of the building being up to date, it can be stated that there is a difference between the maintenance level of the support structure of the building versus the maintenance level of the Skin of the building (e.g., the façade or the roof). In the past, projects for which the whole façade had to be stripped for transformation would have been immediately written off, whilst nowadays, such a building would still be considered for transformation. This shift in the way that developers think of a feasible project is due, for example, to fluctuations and an increase in the cost of concrete, which makes having a sound skeleton which can be reused a lot more attractive for a project and due to technological advancements making the replacement of a façade cheaper over the years[2]. Alternatively, most buildings are maintained based on a maintenance plan, and each building element has a lifespan before they are financially or technically written off. Although being able to reuse is cheaper, a project can still be attractive for the developer if the elements, such as the

2 S. Pronk, personal communication, n.d.

façade, have not been maintained recently, as this means that there would not be as much of a loss in value if they need to be replaced- less disinvestments.

Next, it is stated that the depth of the building must be smaller than 10 meters. This gradual criterion stems from the need for a dwelling to still have sufficient access to daylight after placing a hallway- meaning the dwelling must not be too deep. The building codes also state that an existing structure must be given form to accrue sufficient daylight. Furthermore, a residential area must have an equivalent daylight area that is not smaller than indicated in the building codes (Ministerie van Binnenlandse Zaken en Koninkrijksrelaties, 2012). However, buildings are found in all different shapes. This criterion has been reformulated: "Depth of building allows for the realisation of hallway plus dwellings with acceptable depth dimensions". By doing so, a square-shaped building deeper than 10 meters, with a core in the middle around which internal circulation can be arranged, would not be judged negatively.

Next, it is stated that the height dimensions between floors must be less than 6 meters. This was initially established since commercial real estate is designed with different dimensions (e.g., Spacious communal areas with high floor dimensions). High floor dimensions are only attractive so far as a loft can be created (e.g. if the room is approximately 6 meters, a secondary floor can be added to provide extra square meters). However, typically, the height between floors of office buildings is between 3,60 and 4 meters. Therefore, this criterion has been altered in the Conversion Meter.

Partial transformations versus the possibility of extension

The possibility to extend the building through merging, topping up, horizontally extending the building is a strategy which increases the feasibility of the project as more square meters are added which can be sold or rented after completion. Notably, partial transformations of buildings are more often executed than transformations of whole buildings (figure below). In some cases, this is because a part of the building already has a residential function, and other structures or parts of the building also receive permission to be transformed into a residential function (e.g., the transformation of commercial spaces in the plinths of residential buildings into dwellings). In more than half of the transformation projects, less than 50 per cent of the property's surface area was converted to living space. In approximately one-third of buildings, more than 75 per cent of the property's surface area was transformed- meaning almost the whole building was transformed into a residential function (Centraal Bureau voor de Statistiek, 2021b).

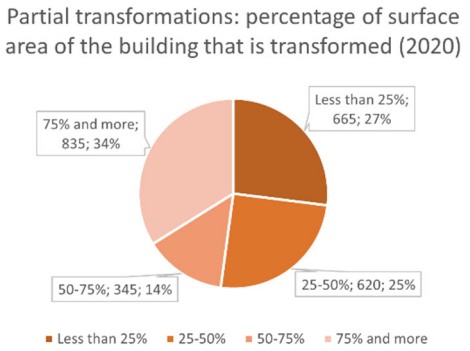


Figure 21: Percentage of surface area of buildings transformed in 2020 (Centraal Bureau voor de Statistiek, 2021b)

Lack of space in inner cities and the role of area re-development

The role of area (re-)development is currently not being considered. The city centres of large cities are dense and lack space for new development[3]. One of the underlying presuppositions is that office or industrial parks, which were often built near highways and/or on the outskirts of the city, are unattractive locations for residential functions. However, as cities expand, these areas are engulfed and surrounded by new neighbourhoods. To illustrate, the picture below shows how the city of The Hague expanded and grew around Binckhorst. Buildings in this area scored lower on the gradual location criteria (e.g., distance to facilities), however, not by much (e.g., by a few hundred meters). This is primarily due to spatial planning and the landscape of The Hague. Binckhorst is spatially separated on the left side by a the Trekvliet canal, which can only be crossed by a bridge or by going around the area. On the right side, Binckhorst is spatially separated from the neighbourhoods to the East by train infrastructure. These spatial characteristics add to the distance between the buildings analysed and the facilities in the area. However, the municipal aim to transform and densify the area into mixed-use area points to Binckhorst being interesting for the future. The zoning plan of the whole area has also been altered and is labelled as a Transformation Area. However, this potential is not captured currently in the analysis.

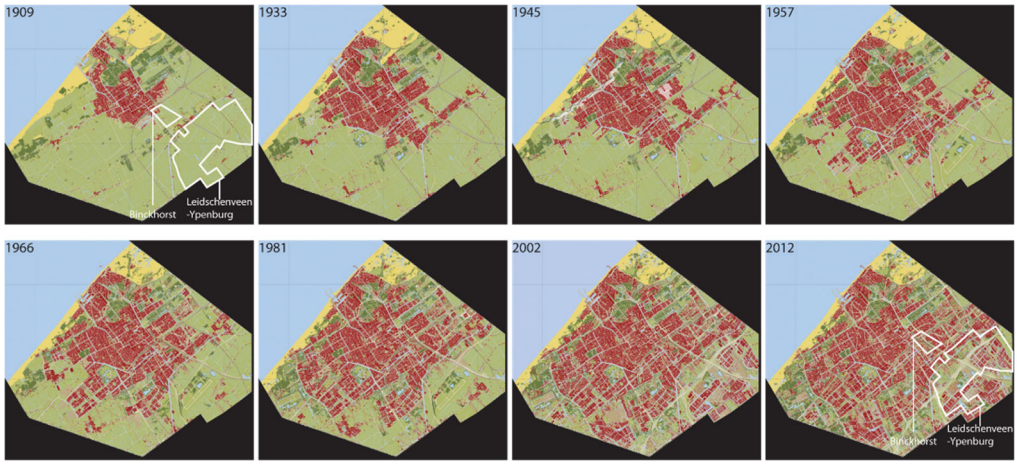


Figure 22: Expansion of The Hague through the years(Haags Historisch Museum, n.d.)

3 V. van der klei, personal communication, November 29, 2023

Applicability of the tool

The conversion meter is a QuickScan, which can provide an initial judgement of the transformation potential of a building to a residential function. Although different approach routes are possible, most of the time, when the architect, developer, or contractor is approached, the potential of transforming the building has already been assessed by, for example, the initiator or building owner. To illustrate, developers of a construction firm's renovation and transformation department were interviewed regarding their two approach routes. The first approach route is a *1-on-1 meeting with the client*. With this approach, the client already has a plan (for example, an initial sketch or model), and together with the client, the firm is responsible for making the project feasible from start to finish. Within this approach, the firm can still influence the budget, propose optimisations, and influence, for example, the choice of materials. There is also a variation of this approach route, namely *chain collaboration*. Within this variation, the construction firm has made project-transcending agreements with clients (for example, a housing corporation) to be allowed to carry out all the projects they have in the future. Following this, the construction firm is active in *tender and bidding* to gain the right to execute projects. Within this approach phase, the client has already figured out the plan to the point that it is realisable. In this phase, the client has several parties bid, and the cheapest bid makes the project. This means that the construction firm is only responsible for making a budget to realise what the client has put on paper and is not responsible for providing optimisations. This approach route also has a variation (*tendering followed by a 1-to-1 process*) in which the client decides to tender the project as described above. In this form, the client selects the winning party, and that party can take care of further optimisations for the client. This means the selection process is based on who can deliver the project for the least amount of money and which party can add the most value during the optimisations. Furthermore, architects and developers have sufficient knowledge of buildings and the transformation process, and past experiences are sufficient to assist their workflow. Therefore, the tools they use to help make plans tangible are tools such as standardised forms to calculate the budget or standardised setups for assessing the structural condition of the building, for example. Therefore, a tool like the conversion meter is not interesting for these actors.

However, the conversion meter could be used to better the knowledge position of public parties. Municipal parties have a role in facilitating the provision of dwellings and keeping the built environment well-balanced. As mentioned, private parties active in the redevelopment sector are more aware of what buildings are suitable and where they are located. In this thesis, the Conversion Meter was coupled with a database with publicly accessed information about buildings, which meant that analysis could be executed on a city level. Coupling such tools together could be valuable for public parties who do not have sufficient insight, compared to private parties, into what makes a building suitable for transformation to a residential function. After the financial crisis of 2008, to steer the transformation of vacant real estate, public parties had to take an active role in informing market players. This was done by, for example, providing quick scans to give insight into the opportunities for transformation, making a vacancy map showing all vacant buildings in the city to start planning for area transformation, adjusting internal procedures to expedite transformation projects, etcetera (Expertteam Vastgoedtransformatie, 2022).

Introduction part 2

This section focuses on where office buildings are in The Hague. First, a general introduction to The Hague will be given to answer this question, followed by an analysis of the office spaces and locations. Consequently, the municipal vision for the different office environments in the Hague will be discussed. Following this, the initial results extracted from Vastgoeddata.nl will be presented.

1.10 The Hague

The city of The Hague, also known as 's-Gravenhage, is the capital of the province of Zuid-Holland and is the third largest municipality in the Netherlands, following Amsterdam (882,600 citizens) and Rotterdam (655,500 citizens). The city counts in 2022 approximately 553.417 inhabitants living across 44 districts and 114 neighbourhoods (Centraal Bureau voor de Statistiek, 2023a). When looking at the age distribution in the city in 2022, it can be noted that 22,1 per cent of the population is younger than 20 years old, and most of the population, namely 63,0 per cent, is between 20 years old and 64 years old, and 15,0 per cent is either 65 years old or older. This makes the average age in The Hague 39,1 years old (Gemeente Den Haag, N.D.-a). The population of the city is divided among 278.233 households, with 47,7 per cent being formed by single-person households, 22,6 per cent formed by cohabitation without children, 20,6 per cent by cohabitation with children and 9,1 per cent formed by single-parent households (Gemeente Den Haag, N.D.-a). Furthermore, the population of The Hague is expected to continue growing in the coming years due to natural growth (births minus deaths), internal migration and immigration (Municipality of The Hague, 2020).

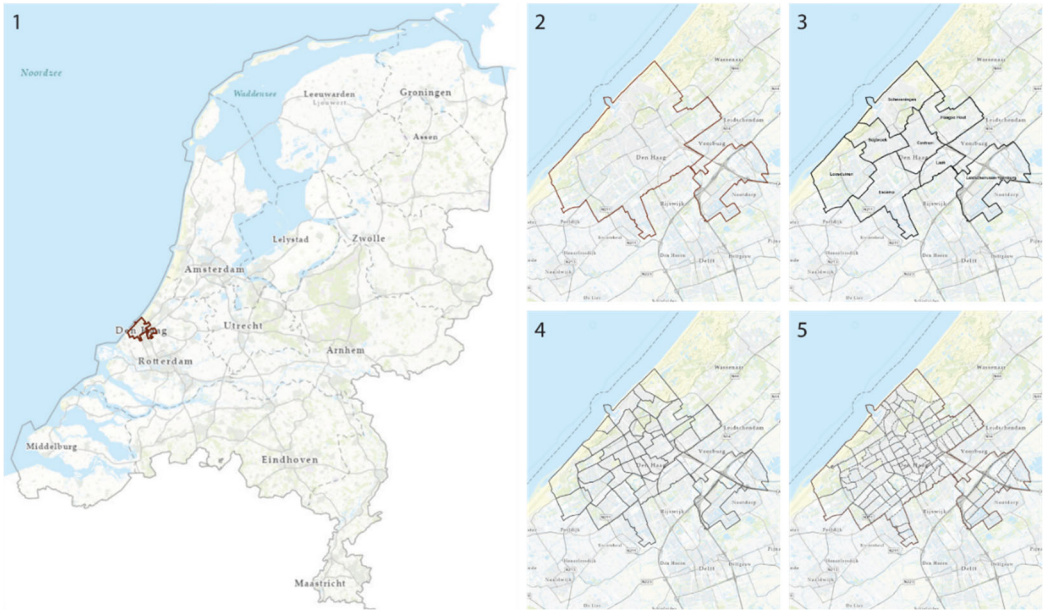


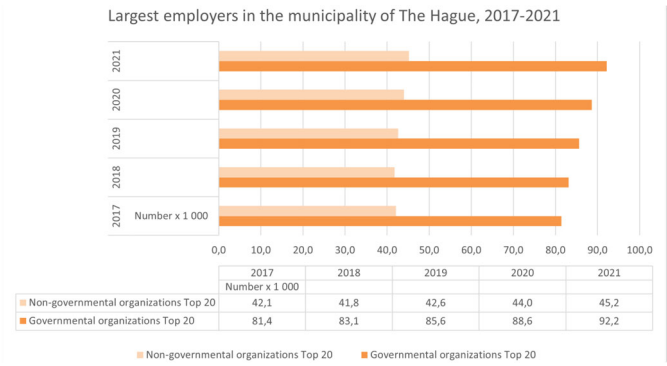
Figure 23: Map of The Hague showing The city with the country (1), the contours of the city (2), the eight boroughs (3), the 44 districts (4) and the 114 neighbourhoods (5) (Gemeente Den Haag, N.D.-b)

To understand the supply of office buildings in The Hague, the following paragraph will focus on the factors which impact the settlement climate for businesses in the Hague compared to other Dutch cities. The Netherlands has traditionally had a dispersed urban pattern. The Hague is geographically positioned between the service cities of Amsterdam and Utrecht and the service and port cities of

Rotterdam. Amsterdam is predominantly known for its concentration of commercial services, whilst Rotterdam is better known for its large seaport, making it, amongst other things, the manufacturing and logistics centre. Alternatively, The Hague is better known for public administration, the presence of international organisations and business clusters in energy and telecom (Meijers et al., 2014). The city has been the administrative centre of the Netherlands since the Middle Ages (even though it is not the capital of the country, nor was The Hague a vital trading city, such as the port cities Rotterdam and Amsterdam, as the port of Scheveningen was primarily a fishing port). The city of the Hague has no major specialisation clusters of companies following the government and international services. Nonetheless, the presence of government and international clusters is still considered a trigger for establishment in the vicinity of other industries (e.g., (semi) public organisations).

The Hague as the governmental centre of The Netherlands

The governing body of The Netherlands is found in the city of the Hague, even though The Hague is not the capital (Raspe & van den Berge, 2018). The reason The Hague was chosen as the governmental centre of the country can be traced back to the fact that the city was considered a neutral city during the 14th and 15th centuries- in other words, the city was not under the authority of a governor. This stimulated the national government of 'the Zeven Verenigde Nederlanden' to settle in The Hague in 1585 and make the Binnenhof the governing centre. Under the French empire, The Hague shortly lost its function as the governing centre of the country. However, this function was reinstated in the 19th century when the French rule ended (Raspe & van den Berge, 2018). Today, The Hague is home to the government and administration, the residence of the royal house, most of the ministries and the supreme court. The public sector in the city forms by far the largest employer, followed by international diplomacy, financial services, telecom and oil and gas sectors. The city of the Hague has a significant degree of governmental organisations. When looking at the top 20 largest employers in the Hague in the Quaternary sector of the economy, meaning all employers who provide non-commercial services (e.g., defence, health care, public administration), it can be noted that these employers provided jobs for 92,200 workers in 2021 (Centraal Bureau voor de Statistiek, 2021a). To illustrate, The Hague's top 20 non-governmental organisations provide jobs for 45,200 employees in 2021 (figure below).



	2017	2018	2019	2020	2021
Number x 1 000					
Non-governmental organizations Top 20	42,1	41,8	42,6	44,0	45,2
Governmental organizations Top 20	81,4	83,1	85,6	88,6	92,2

Figure 24: Figure showing the proportion between the 20 largest governmental and non-governmental employers in The Hague (Centraal Bureau voor de Statistiek, 2021a)

The Hague as the international city of peace and justice

The city of The Hague is also known as the international capital of peace and justice and has a cluster of international organisations. This development originated in the nineteenth century and resulted

from remediating the arms race between the European superpowers through international consultation and conflict management. Within this goal, the Netherlands was seen as an appropriate host because of their policy on neutrality. Furthermore, The Hague was already on the map as a meeting place for international law through other endeavours. Thus, The Hague hosted the first and second Peace Conference, and in the early 20th century, the Peace Palace was constructed, followed by several tribunals (Raspe & van den Berge, 2018). This development has resulted in many international organisations and supporting facilities concentrating in the 'International Zone' (e.g., embassies, consulates, international schools, and knowledge institutes) (Meijers et al., 2014).

Development of the CID

The Central Innovation District (CID) is the second top metropolitan location in the province of South Holland because of its international economic environment, with first-class modern office locations in the top segment. The CID is part of a long-term development plan that aims to spatially unite the separated office locations surrounding The Hague Central Station, Laan van NOI, and Holland Spoor together so that these areas can be experienced as one location with one office market. To illustrate, the area surrounding The Hague Central Station is used by many target groups (e.g., travellers, tourists, students, and workers) and the office users in this area are diverse. Alternatively, the office users around the Wijnhavenkwartier are predominantly formed by central government ministries and faculties of Leiden University. The Beatrixkwartier, however, is more geared towards providing office spaces for traditional business services. The municipality has set up different spatial principles to steer the development of the CID into a metropolitan area with a high concentration of workplaces, facilities, housing, high-quality public space and good accessibility. Blending different functions is also essential (Cushman & Wakefield Research, 2022).

The coastal zone

Furthermore, The Hague borders along the ocean and has two beaches, Scheveningen and Kijkduin. The development of these areas was stimulated by the government's understanding of the consumptive nature of its residents and the impact on the city's economic development. Thus, from the 18th century, the government invested in urban pleasures (e.g., beautiful green walks, the seaside) to enable economic prosperity for the city. The idea was that by providing a rich cultural infrastructure, the people would be inspired to spend their money freely, which would benefit the local industry and increase the city's tax income. Thus, the proximity of the seaside and the attractiveness of the inner city increased the attractiveness of The Hague (Raspe & van den Berge, 2018).

The office market of The Hague

The general development that can be seen in the Netherlands regarding the development of office buildings after the Second World War is that office buildings were first built in the historical city centre in the fifties. Following this, offices and industrial real estate users relocate to working areas created post-war along the city's outskirts. Consequently, office buildings were developed along the access roads in the seventies and eighties. The introduction of monofunctional office districts near highways on the city's outskirts started in the 1990s. After the 2000s, the development of offices near public transport hubs in the city became popular. The changes in location preference were, through the years, mainly driven by shifting views on accessibility, visibility, surrounding resources, and the possibility to expand (Van Meijel & Bouma, 2013).

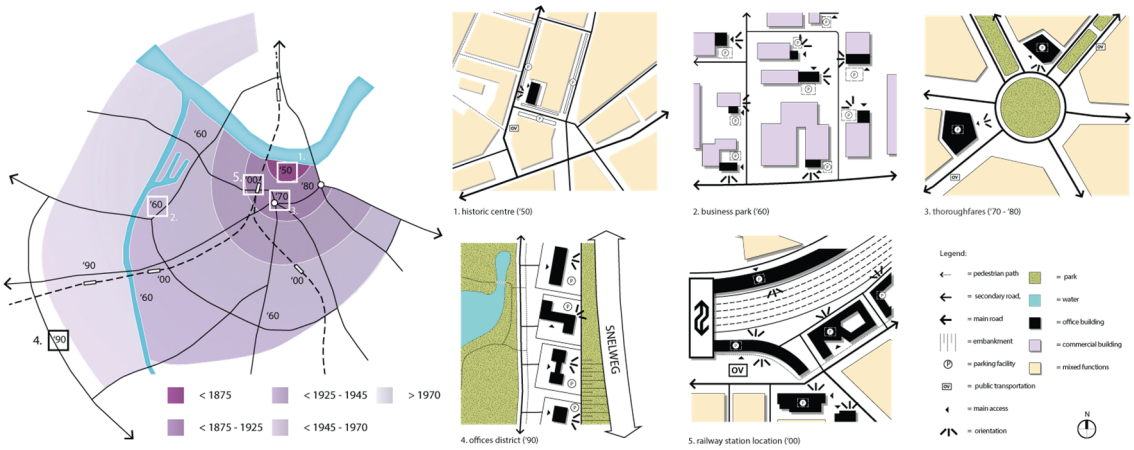


Figure 25: Conceptual representation of the development of office buildings in Dutch cities between 1945 and 2015(Van Meijel & Bouma, 2013)

Zooming in on the city of The Hague, it can be noted that it is the municipality with the second largest stock of office buildings in the Netherlands, following Amsterdam (Figure 26) (NVM Business, 2021a). The city of the Hague counts many office buildings amounting to 3.653.500 m² of office space in 2020 (NVM Business, 2021a).

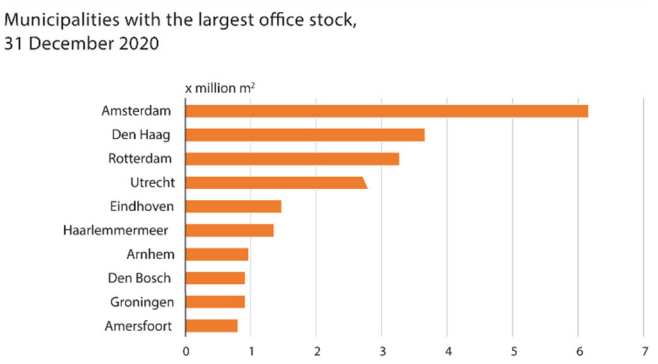


Figure 26: Municipalities with the most extensive office stock in the Netherlands (NVM Business, 2021)

The Municipality of The Hague (2018) describes seven office environments in The Hague (Figure 27), namely, (1) Inner-city centre location, (2) Creative environment, (3) International interaction environment, (4) Top metropolitan environment, (5) Highway B2B, (6) Urban interaction environment, (7) Outside office concentrations (Municipality of The Hague, 2018).

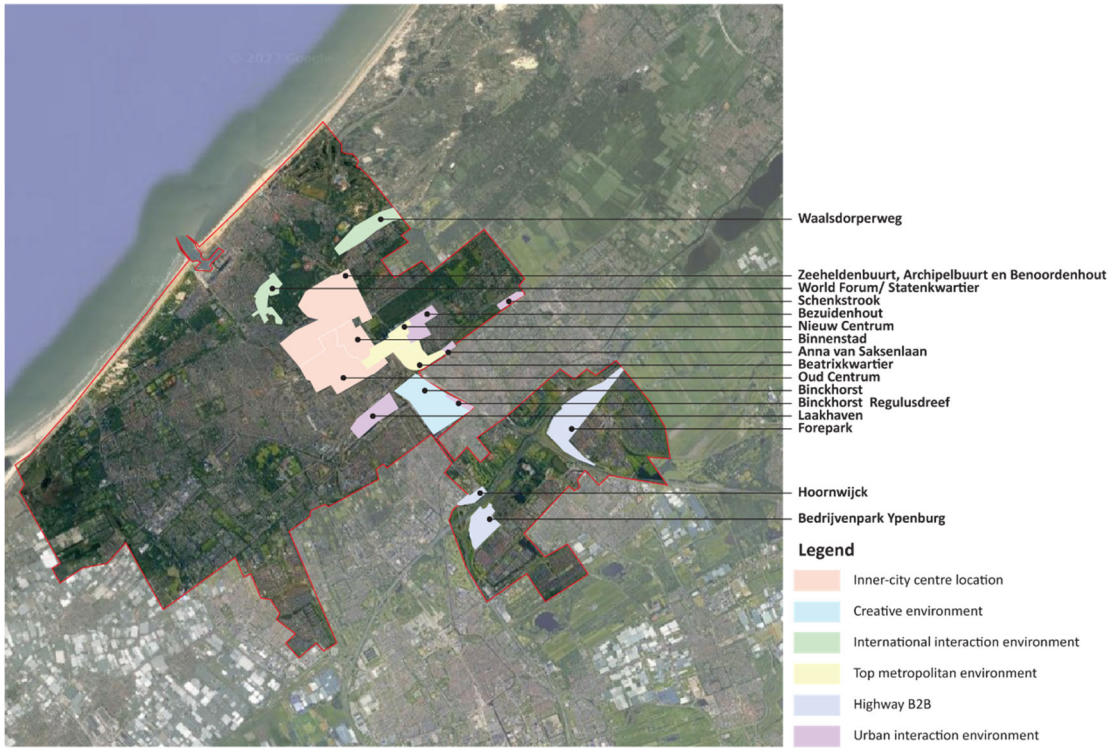


Figure 27: Location of office environments in The Hague (Municipality of The Hague, 2018)

(1) Inner-city Centre Location

Approximately 27 per cent of the office usage in The Hague is centred around inner-city centre locations (City centre, Oud Centrum and Zeeheldenbuurt, Archipelbuurt en Benoordenhout). The vacancy in this environment can mainly be found in small (up to 500m²) and medium-sized office spaces (501-5000m²).

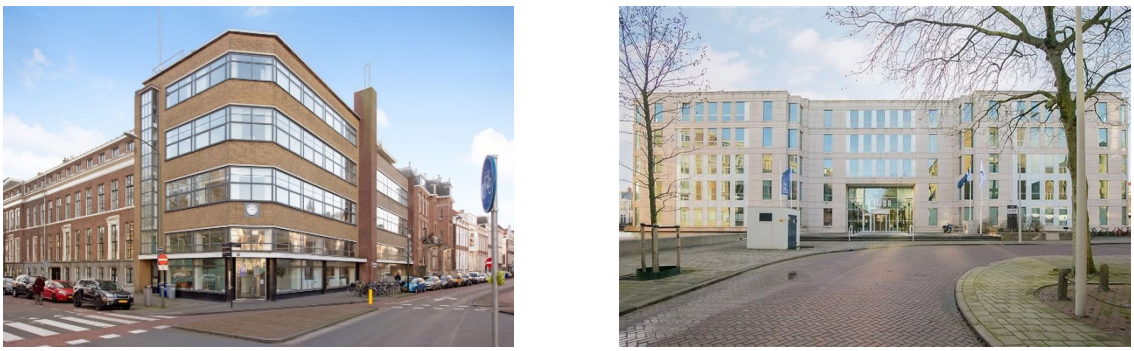


Figure 28: Example of office buildings in the Inner-city Centre Location, including an office building in Zeeheldenkwartier (Flexas, N.D.) and an office building in Archipelbuurt (Funda in Business, N.D.)

(2) Creative Environment

Approximately 5 per cent of office usage can be found in the creative Environment and is characterized by creative companies, unique areas, and differentiating concepts (e.g., Caballero factory). This form

of office environment is found in the Binckhorst in The Hague. The vacancy within this environment mainly concerns medium-sized office buildings (501-5000m²). Office buildings found in this environment, specifically the Binckhorst area, are considered too monofunctional. There are too many large single-tenant buildings and too few supporting facilities, and this environment is not lively enough.

Figure 29: Example of an office building in the Creative Environment including Caballero factory (CAbfAb, N.D.) and Bink 36 flex work office building in Binckhorst (Studio Nelson, 2018)

(3) International Interaction Environment

This office environment represents approximately 6 per cent of the office use in The Hague and is characterized by a concentration of (semi) public international institutions. Approximately 5 per cent of the space in this environment is empty and concerns both small (up to 500m²) and medium-sized office spaces (501-5000m²). Office buildings in this area do not meet the requirements of international institutions. International institutions demand large-scale offices; however, mainly small office spaces are available in this area. The large-scale office spaces in this area do not meet the security requirements of international institutions (e.g., they have parking space directly under the building, which poses a risk for bomb cars, and they do not have two separate access routes). Neither do they meet the requirements of a court/ tribunal (e.g., containing a large room without obstructive columns).

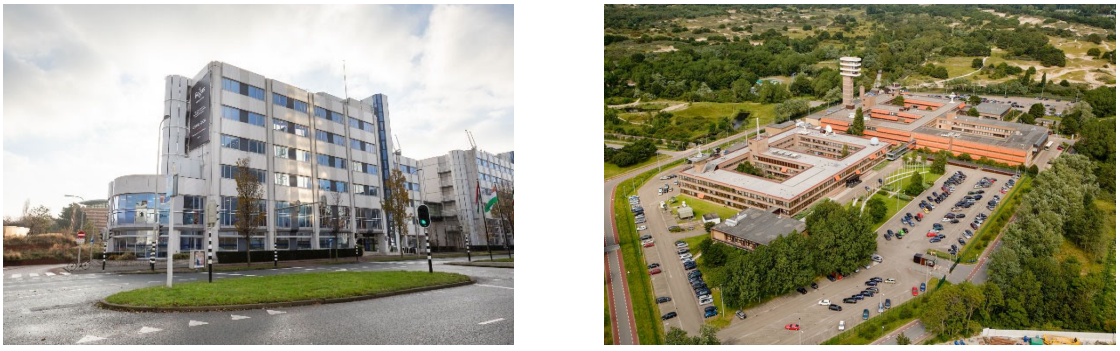


Figure 30: Example of office buildings in the International Interaction Environment, including Regus World Forum Den Haag (Funda, N.D.-c)and the NATO Complex by the Oude Waalsdorperweg in The Hague (NCIA, N.D.)

(4) Top metropolitan environment

Approximately 27 per cent of the total office use is part of the Top Metropolitan Environment (Nieuw Centrum and Beatrixkwartier)-making it the largest office environment in The Hague. The area has a

large office stock and is characterized by many metropolitan amenities, good access to public transport and a wide variety of informal meeting places. Office buildings in this environment are made for large users, whilst the demand for space is geared towards small users, freelancers, and starters (except for the needs of central government departments). Next, office buildings found in this environment, specifically the Beatrixkwartier, are considered too monofunctional. There are too many large single-tenant buildings and too few supporting facilities, and this environment is not lively enough.


Figure 31: Example of office buildings in Top Metropolitan Environment, including Zilveren Toren (CBRE, 2020)and Haagse Poort (CBRE, N.D.) in the Beatrixkwartier

(5) Highway B2B

The highway B2B work environment comprises 5 per cent of office usage in The Hague and includes areas such as Business Park Ypenburg, Binckhorst Regulusweg, Forepark and Hoornwijck. This environment is typified by its proximity to the highway and its monofunctionally. A considerable part of the office stock in The Hague, namely 256,300 m², can be found within this environment. The vacancy within this environment can mostly be found in small and medium-sized office spaces and amounts to approximately 31%.


Figure 32: Example of office buildings in Highway B2B, including Castellum complex in Forepark (Alberts & Van Huut, N.D.) and office building in business park Hoornwijck (Funda, N.D.-b)

(6) Urban interaction environment

The urban interaction environment represents approximately 8% of the office use in the Hague and can be found in the following areas: Anna van Saksenlaan, Bezuidenhout, Laakhaven and Schenkstrook. This environment is also typified by good access to public transport and a high-quality environment that facilitates the workflows of companies, investors, and knowledge workers. This

environment has an office stock of 370,700 m² (2017), and vacancy in this environment is predominantly found in medium-sized buildings.

Figure 33: Example of office buildings in the Urban Interaction Environment, including office building on the Anna van Saksenlaan (Funda, N.D.-a)and the Haagsche Zwaan in Bezuidenout (Architectenweb b.v., 2008)

(7) Outside office concentrations

Approximately 23% of the office usage in The Hague is concentrated outside of office locations (over 1 million m²). The companies or organizations found in these environments often value functional office spaces, are more conscious of price, and attach less importance to the status of a location. Most office spaces found within these environments compromise office spaces up to 500m². However, the vacant stock also consists of medium-sized office spaces.

Issues with the office market of The Hague

In the document "Kantorenstrategie Den Haag 2018-2025", the municipality specifies the demands and bottlenecks observed in the office market in the Hague. These issues are summarized and discussed below.

Competition for scarce space

As mentioned previously, the population of The Hague is expected to increase yearly, and accordingly, the overall demand for space also increases (e.g., housing, facilities, office spaces, and commercial areas). The constraints on space, especially in the city centre, as the spatial opportunities for development are limited, lead to dilemmas which require choice as not every program of requirement can be realized. Therefore, especially in the city centre, certain functions can only be realized through transforming office buildings (e.g., the realization of museums and related facilities in the Museum quarter) (Municipality of The Hague, 2018).

Mismatch

In The Hague, there is quantitatively sufficient stock to supply the city's needs. However, space-seeking office users can still not find suitable office space in desired office environments (Figure 27). The table below depicts an estimate of the required and available number of square meters of gross floor area of office space in 2025 divided by office environment calculated in 2017. This estimate was created by considering transformation plans (known in that period), plans for new buildings in these areas, and the expected economic growth. There are significant differences between what is required and available in the different office environments. An oversupply of office space (111.700 m² g.f.a.) is expected in highway locations, whilst a significant undersupply (116.600 m² g.f.a.) is expected in the Binckhorst area.

Table 16: Estimate of the required and available number of square meters of the gross floor area of office space in 2025 divided by office environment calculated in 2017 (Municipality of The Hague, 2018)

	Required stock 2025 A	Available stock 2025 B	Difference C=B-A
Inner-city centre location	1.026.800	994.500	-32.300
Creative environment	288.300	171.700	-116.600
International interaction environment	276.400	246.900	29.500
Top metropolitan environment	1.153.200	1.186.500	33.300
Highway B2B	118.500	230.100	111.700
Urban interaction environment	256.700	302.800	46.100
Outside office concentrations	829.300	838.100	8.800
Total	3.949.200	3.970.700	21.400

Figure 34: Depicting of under and over-supply expected in different office environments in the Hague by 2025 (own image with data from (Municipality of The Hague, 2018)

Municipal view on transformations

The municipality of the Hague is interested in steering the withdrawal of office space in the city. Within that goal, the municipality aims to take a restrained position regarding transformations above 1500 m² GFA (Municipality of The Hague, 2018). The municipality has decided to brake the automatic withdrawal of office space as there are also shortages in the office market in specific office environments. However, the current policy adopted by the municipality does not limit transformations. Furthermore, the municipality also intends to respect the current transformation plans as these plans would not deregulate the supply on the office market and would provide new housing or other functions. Furthermore, to transform, the plans must align with the zoning plan and be approved by the municipality. Thus, the structural vision and district programs of neighbourhoods are used to check if the municipality has stipulated their wishes for a specific building.

1.11 Step 0: Inventory market supply of office buildings

To create a list of potential buildings, the following filters were applied to the office stock of The Netherlands:

1. The building is in the municipality of The Hague.
2. The building has an energy label worse than C, meaning D, E, F, G, or "Unknown".
3. The useable floor area is at least 3000m².
4. The building is not a listed monument.
5. The building has the purpose of “office building” assigned to it.

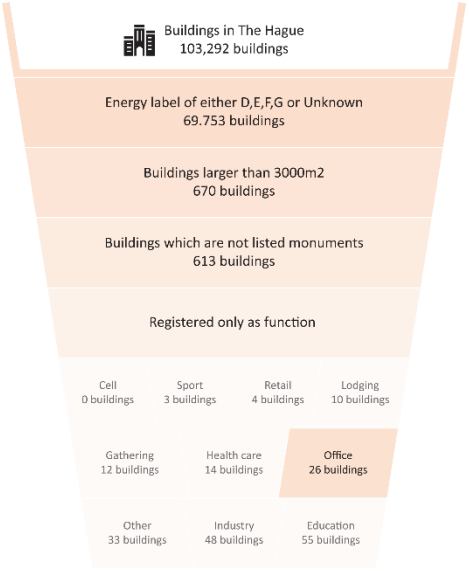
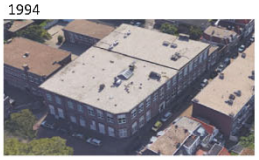


Figure 35: Funnel graph depicting results of initial filtering. Own graph with data from Vastgoeddata (2023). These numbers are a snapshot taken at the beginning of 2023 and could have been altered since.

In The Hague, 103,292 buildings are registered, of which 69,753 have an energy label of D, E, F, G or Unknown. Approximately 10 per cent of this stock is larger than 3000m²- 670 buildings, to be exact. Roughly 8 per cent, 57 buildings, are listed monuments, bringing the total down to 613 buildings. When the purpose of the building is also filtered, it can be noted that there are 26 buildings (Vastgoeddata, 2023). It can be noted that most of the buildings can be found in the northeastern and south-eastern parts of the city. The location and pictures of these buildings can be seen in the figures below.

Figure 36: Location of 26 buildings which made it through the initial filter (Vastgoeddata, 2023)

Filters used: The Hague, only office buildings, minimum size of 3000m2, energy label D,E,F,G,Unknown, not listed monument

					
Building 1-5					
adress	Prinses Beatrixlaan 23	Alexanderveld 125 e.a.	Oude Waalsdorperweg 10	Badger Building, Binckhorstlaan 117 e.a.	Spaarneplein 2 e.a.
District	Bezuidenhout	Archipelbuurt	Oostduinen	Binckhorst	Stationsbuurt
Neighbourhood	Bezuidenhout-West	Archipelbuurt	Oostduinen	Binckhorst	Rivierenbuurt-Zuid
Surface area m2	53388	48317	46409	22120	18579
Built Year	1985	1958	2015	1984	1922
					
Building 6-10					
adress	Prins Clauslaan 20	Kerketuinenweg 2 e.a.	Saturnusstraat 9	Van Alkemadelaan 786-D-33	Laakpoort-gebouw, Rijswijkseweg 60 e.a.
District	Bezuidenhout	Loosduinen	Binckhorst	Westbroekpark en Duttendel	Laakkwartier en Spoorwijk
Neighbourhood	Bezuidenhout-West	Kerketuinen en Zichtenburg	Binckhorst	Duttendel	Laakhaven-Oost
Surface area m2	16952	13565	13282	12869	11770
Built Year	1957	1991	2008	1978	1975
					
Building 11-15					
adress	Haagse Hoge Huis, Waldorpstraat 80	Oostduinlaan 2	Oranjestraat 15 e.a.	De Werf 13	Bezuidenhoutseweg 60
District	Laakkwartier en Spoorwijk	Benoordenhout	Centrum	Loosduinen	Haagse Bos
Neighbourhood	Laakhaven-West	Arendsdorp	Voorhout	Kerketuinen en Zichtenburg	Haagse Bos
Surface area m2	10570	9874	9565	8120	7965
Built Year	2005	1920	1875	1981	1972
					
Building 16-20					
adress	Lange Houtstraat 4 e.a.	Calandstraat 12	Scheveningseweg 64	Leggelostraat 85	Bordewijklaan 15
District	Centrum	Laakkwartier en Spoorwijk	Geuzen- en Statenkwartier	Morgenstond	Mariahoeve en Marlot
Neighbourhood	Voorhout	Laakhaven-West	Statenkwartier	Morgenstond-Zuid	Burgen en Horsten
Surface area m2	6144	5678	5381	4500	4209
Built Year	1906	1965	1989	1964	1994
					
Building 21-25					
adress	Koningskade 40	Willem Lodewijklaan 10	Zonweg 33	Lange Voorhout 13	Prinsessegracht 21
District	Haagse Bos	Zorgvliet	Binckhorst	Centrum	Centrum
Neighbourhood	Haagse Bos	Zorgvliet	Binckhorst	Voorhout	Voorhout
Surface area m2	3741	3640	3513	3277	3214
Built Year	1994	2003	1971	1800	1925
					
Building 26					
adress	Kerklaan 195				
District	Scheveningen				
Neighbourhood	Visserijbuurt				
Surface area m2	3125				
Built Year	1912				

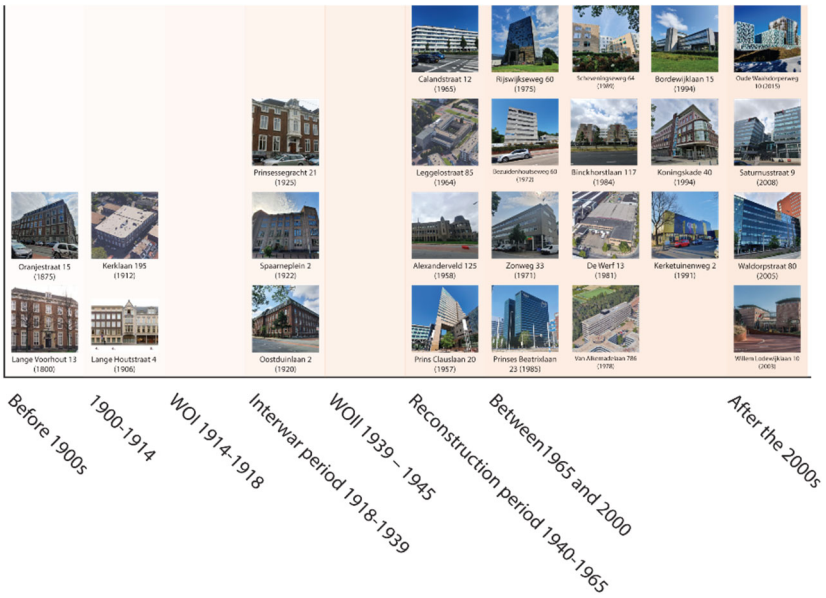
1.12 Characteristics of the buildings

Energy label

Most of the buildings found were due to the unknown energy label. This means that the building owner has not executed an assessment yet, which has been registered. This assessment is automatically done once a building is renovated.

Built year

Most of the buildings date from the 20th century. Only two buildings date from before the 1900s - both in the city centre. 2 buildings date from before the First World War, whilst no buildings were built during the First World War. Three buildings dating from the interwar period were found. Four buildings date from the reconstruction period (1940-1965). Furthermore, 11 more buildings date from after the reconstruction period up to the turn of the century. Lastly, four buildings date from after the 2000s.



Building size

Six of the buildings have a size between 3000m² and 4000m². A relatively equal number of buildings were found, larger than 4000m² and smaller than 10.000m². Five buildings are larger than 10.000m², and two are larger than 15.000. Next to that, four buildings were found which are larger than 20000m².

Supply and demand

Ten buildings are in areas where an undersupply is expected in 2025, and eight are in areas where an oversupply of office buildings is expected. Next to that, eight buildings are located outside of office environments.

Introduction part 3

The main question being answered in this first is as follows: What is the transformation potential of this building stock, and what are the risks and opportunities present within this building stock when it comes to using transformation as a strategy to prolong its lifespan? To answer this question, firstly, the housing needs in The Hague will be discussed broadly, focusing on the target groups the municipality of the Hague aims to focus on in the coming years. This is followed by analysing neighbourhood programs and structural vision to determine the municipal vision for the neighbourhoods where the 26 buildings can be found. Following this, the buildings which are left over will be analysed using the criteria stipulated in step 2 of the Conversion Meter.

1.13 Demand for housing in The Hague

As mentioned previously, the population of The Hague is growing and is expected to keep growing (Municipality of The Hague, 2020). The housing built in the past few years has not been sufficient to absorb the housing needs. This has led to price increases in both the owner-occupied and rental sectors. However, higher-income households are less impeded by the price increases compared to low-income and mid-income households. Furthermore, many new housing in the city have been built primarily for the medium and high-end segments as these segments are more attractive to developers and investors. According to the municipality, the following issues are seen in the housing market:

Less affordable dwellings in the private rental sector

Rental dwellings in the private sector (approximately 60.000 dwellings) are essential for low-income households and starters and households who need a dwelling fast. People who rent in this segment typically live in a dwelling for a short period (< 2 years). The private rental sector has grown significantly in the past ten years compared to the owner-occupied sector and corporation dwellings. This is because, from the point of view of investors, real estate is seen as an attractive investment opportunity, stimulating trends such as 'buy to let'. On the other hand, because of the cost of buying a house and the strict mortgage requirements, fewer people can buy a house, increasing the demand for rental dwellings. This has resulted in high rental prices and a limited supply of affordable rental dwellings in the private rental sector (Municipality of The Hague, 2020).

Starters have a difficult time

Approximately 40% of households which move are formed by starters. However, starters have difficulty receiving a mortgage due to stricter mortgage requirements and labour market flexibilisation (replacement of permanent staff with flexible workers). Next, starters must also compete with investors with better buying positions. Because of these factors, starters often end up in the private rental sector (58%), and a few starters buy a dwelling (approximately 13%). Households with a lower or average income cannot buy a dwelling in the city. Thus, starters are forced to search for dwellings in the rental market. At the same time, the price increases in the private rental sector and the limited supply of affordable/mid-priced dwellings ensure that starters have limited success in the private rental sector (Municipality of The Hague, 2020).

Insufficient affordable housing for citizens with low income

Approximately half of the households in The Hague earn an income under €36.165, the maximum amount a person can earn to qualify for social housing (2017). Approximately half of this group also lives in social housing rented out by a corporation. Approximately a quarter of the low-income households also live in owner-occupied dwellings (23%). Thus, for the group, restrictions formed by

their income make dwellings in the affordable rental and owner-occupied sector accessible. The accessible sector is getting tighter (Municipality of The Hague, 2020).

Insufficient supply of corporation housing

The social housing sector provided by corporations consists of approximately 83.000 dwellings (2020), which amounts to approximately 31% of all dwellings in The Hague. However, this supply is insufficient compared to the demand for social housing, as noted from the long waiting lists. As mentioned above, the starters have the most difficulty finding a dwelling in this sector (Municipality of The Hague, 2020).

Corporations have a low investing capacity

Housing corporations in The Hague have the lowest investment capacity of Dutch corporations, which means that they cannot achieve all their goals. Typically, corporations are expected to maintain their building stock, improve the buildings when needed, restructure the housing stock, contribute to the energy transition, maintain the rents low and build 30% of the total housing production socially (Municipality of The Hague, 2020).

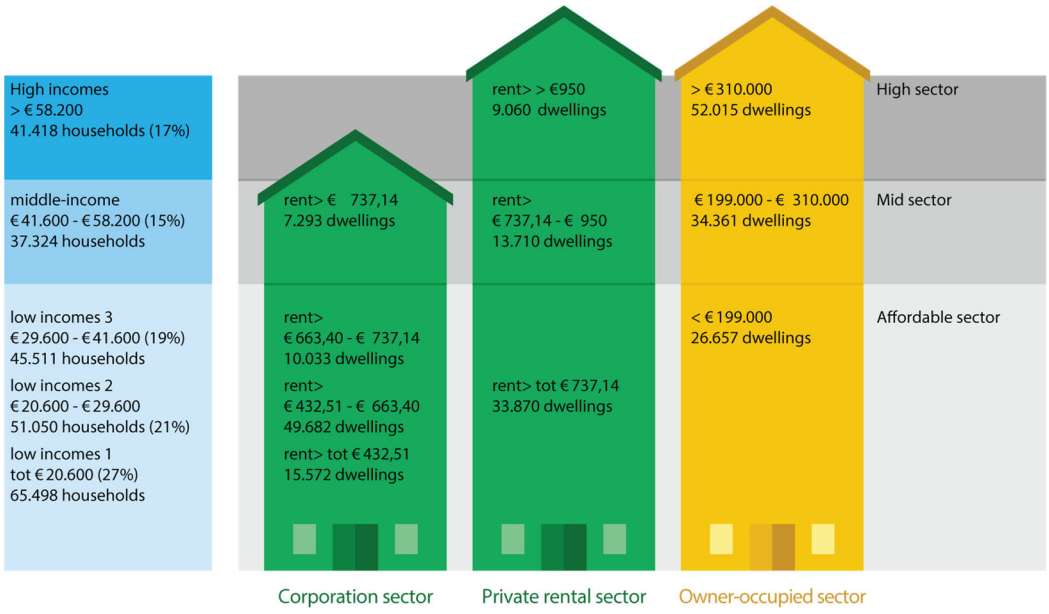


Figure 37: Depiction of the number of households divided into income brackets as well as the number of housing units divided by sector and price segment in 2020 (Municipality of The Hague, 2020)

1.14 Structural and Housing Vision The Hague

Each municipality must provide a spatial development strategy for its floor area to ensure proper spatial planning. This document presents an integrated vision of an area focusing on where and how developments must occur. It depicts the relationship with policy in the different fields such as economy, recreation, and housing. For The Hague, a few structural visions are made, each focusing on the (re-) development of different neighbourhoods. The structural vision for the Hague will be analysed to gather what the municipality aims to realise in each district. Next to that, the municipality also provides a housing vision (the latest being the housing vision for 2017-2030) that outlines the desired developments for housing in the medium term in terms of target groups, price segments, and living environments. The central vision can be summarised in three keywords: urban, attractive, and inclusive. The city of The Hague should provide a distinctive and attractive urban living environment that is affordable for its residents whilst future-proofing the neighbourhoods and ensuring they are well-mixed. As a result, new development, transformation, and renovation programs should facilitate this goal. The vision and goals relevant to these neighbourhoods' future development are summarised below.

The vision is to make room for at least 25.000 more workplaces in the CID and approximately 20,500 dwellings for approximately 40.000 residents. Next, the municipality expects an addition of 640.000 m² of office spaces and 260.000 m² of commercial and social facilities. The aim is to add housing with various housing types to satisfy different target groups. The municipality aims to hold a minimum of 30 per cent social housing and 20 per cent mid-segment rent for new buildings. Furthermore, attention is focused on further connecting the three stations in the area (The Hague HS, The Hague Central Station and Laan van NOI) (Municipality of The Hague, 2021c).

Socially inclusive city

The population of The Hague continues to grow, including the number of citizens with a low income. Thus, there is an increasing demand for affordable housing. Next, a divide can be seen between attractive neighbourhoods with very little affordable housing and large regions in the city with predominantly social housing. Thus, the goal is to improve the architectural and energetic quality of the existing stock whilst also adding new housing types to the housing stock (Municipality of The Hague, 2017).

The first ambition can be seen in the table below and entails the following relevant goals. Firstly, when it comes to new buildings, 30% of the dwellings should be in the social sector. The aim is to have an annual increase of 600-750 rental dwellings in the social sector. To increase the supply of affordable housing in the city centre, smaller units will be built for starters or recent graduates. Next, the municipality aims to provide sufficient dwellings for vulnerable groups. These dwellings should be divided across the city and well-integrated into the neighbourhood. Lastly, the aim is to provide a better supply of mid-segment dwellings for residents who are now living in dwellings which are too inexpensive for them (also called scheefwonen in Dutch) to stimulate flow out of the low-segment dwellings. This will be done by providing temporary contracts to starters and by adding 400-500 mid-segment dwellings a year.

Table 17: ambitions and the relevant principles of the goal to make The Hague a socially inclusive city (Municipality of The Hague, 2017)

Ambition 1
The city of The Hague will, by 2030, be an affordable city for people with a low or mid-income.
By adding sufficient affordable dwellings for low-income households.
By adding sufficient temporary dwellings for vulnerable groups who are not yet in control of their lives (e.g., the homeless population, handicapped population, and refugees).
By increasing the supply of dwellings for mid-income households by 2030.

Next to that, the municipality expects cooperation between corporations, municipality, and other parties to improve the following neighbourhoods with an unbalanced housing stock in the short to mid-term: Den Haag Zuid-West (primarily Moerwijk and Bouwlust), Mariahoeve, Laak, Transvaal Noord, Schilderswijk en Nieuw-Waldeck. In the long term, the following neighbourhoods will be focused on: Bezuidenhout-West, Schipperskwartier, Molenwijk, Laakhavens, Kortenbos, and Kompasbuurt. Next, social housing will be realised in the centre and areas like the CID to attract students, young creatives, freelancers, and entrepreneurs. Midsegment housing will be added throughout the city to increase the differentiation in the neighbourhoods and improve the movement to new dwellings within neighbourhoods (Municipality of The Hague, 2017).

Table 18: Ambitions and the relevant principles of the goal to make The Hague a socially inclusive city (Municipality of The Hague, 2017)

Ambition 2
The city of The Hague is, by 2030, a socially inclusive city in which socioeconomic differentiation is stimulated whilst the stock of social housing is safeguarded.
By providing households with low incomes with more choices regarding their preferred housing environment.
Ambition 3
One-sided neighbourhoods in The Hague will be more mixed by 2030.
By improving and renewing vulnerable neighbourhoods.
By adding more social housing in affluent neighbourhoods and larger transformation areas around public transport hubs.

Attractive and welcoming residential city

To compete nationally and internationally, the municipality of The Hague aims to increase the city's attractiveness and provide an optimal business and residential climate for companies, young professionals, urban families, expats, and the entrepreneurial middle class. Therefore, essential areas of improvement are ensuring that the city is internationally and digitally accessible, providing a variety of attractive living environments in combination with sufficient cultural activities, international education as well as vocational and university studies and providing high-quality outdoor spaces with various recreational and sports facilities.

The municipality of The Hague aims to add a 'Central Innovation District (CID)' focusing on attracting innovative companies, higher education facilities and knowledge institutes, providing space for urban living, increasing leisure facilities and increasing the number of students. The further development of Binckhorst is also essential for the creation of CID. More housing will be added to this area while balancing urban living and work environments. The municipality also sees the potential in densifying the areas around the city centre, the main train stations, and the coastal zone. Next to adding new dwellings, the municipality aims to add complementary residential concepts in the quiet urban residential environments, such as Bomenbuurt, Bloemenbuurt and Vruchtenbuurt, should buildings become vacant (Municipality of The Hague, 2017).

Table 19: ambitions and the relevant principles of the goal to make The Hague an attractive and welcoming residential city (Municipality of The Hague, 2017)

Ambition 1
To support the city's distinctive quality of life and economic business climate, focus will be paid to having a more diverse and attractive urban residential environment by 2030.

Furthermore, the municipality aims to focus its housing goals on a set of target groups because of their contribution to the international, friendly, lively, and economic profile of the Hague. These target groups are essential for Binckhorst, the CID, the coastal zone and the urban fringe (Municipality of The Hague, 2017).

Young urban professionals

The goal is to provide small, affordable, and mid-priced dwellings (rent and owner-occupied), especially in the CID and Binckhorst, and to continue providing quality dwellings in the existing stock of affordable private rental stock in the neighbourhoods in the and around the city centre.

Urban families

The goal is to provide flexible family apartments and houses (rental and owner-occupied segment), especially with the renovation of Zuid-West and Mariahoeve and in the affordable and lively urban districts around the city centre. Next to this, the municipality also aims to add self-build locations in quiet urban areas.

Empty nesters

The goal is to provide attractive apartments in the mid and high segments (rent and owner-occupied) for empty nesters in the coastal zone.

Expats

The goal is to provide furnished homes or full-service concept dwellings in the CID and the Internationale zone for small expat households.

Students

The goal is to provide more student dwellings in the CID, according to the demand. In other areas of the city where it is relevant to build student dwellings, dwellings should be added on small scales in the vicinity of education facilities, primarily through transformation. The municipality also states that mixing these dwellings with other target groups is preferred.

Table 20: ambitions and the relevant principles of the goal to make The Hague an attractive and welcoming residential city (Municipality of The Hague, 2017)

Ambition 2
The Hague focuses on building attractive residential environments specifically for the following target groups: young urban professionals, urban families, empty-nesters, expats, and students.

This aim guarantees the quality of the urban environment by providing guidelines for attractive and sustainable housing developments whilst also densifying the city. The municipality provides the minimum requirements for transformation projects to ensure sufficient quality in office transformations (e.g., sound, sustainability, differentiation).

Table 21: ambitions and the relevant principles of the goal to make The Hague an attractive and welcoming residential city (Municipality of The Hague, 2017)

Ambition 3
The Hague aims for an affordable, sustainable transformation and improvement program.

To supply the increasing demand for affordable and temporary dwellings, the municipality aims to allow the temporary usage of vacant or to-be-demolished buildings, stimulating flexible buildings to enable the possibility of enlarging small dwellings should the housing preferences change and other such strategies. Next, the municipality also aims to utilise the possibilities of a flexible zoning plan. If desired, the municipality will allow temporary rental constructions for specific target groups (e.g., students, expats, migrant workers).

Table 22: ambitions and the relevant principles of the goal to make The Hague an attractive and welcoming residential city (Municipality of The Hague, 2017)

Ambition 4
The city welcomes its new citizens and ensures they quickly find suitable and affordable housing.

Future-proof Housing Stock

The main reason for this ambition is the housing stock needing maintenance, the low energy performance of existing buildings, and the housing stock being unsuitable for unassisted living. Lack of maintenance can have a negative impact on the appearance of the neighbourhood and can also have an impact on the health and safety of the residents. Next to this, The Hague aims to be climate-neutral by 2040, and therefore, renovating the current stock of existing buildings is imperative. Lastly, to combat the high costs of healthcare and an ageing population, the goal is to keep the elderly living independently for a more extended period. To realise this, the dwellings must be accessible and be equipped with the right equipment. Thus, the lack of suitable independent housing with care facilities is a priority.

An oversupply of suitable dwellings for people with physical impairments is needed because people currently inhabit the available dwellings without impairments. More variety within these dwellings is also needed to increase the choice. These dwellings can be added through new buildings, transformation, or renovation. Next to this, the municipality also wants to stimulate the transformation of healthcare buildings into housing specifically for vulnerable groups of people (e.g., homeless people). Variety and sufficient choice in types of dwellings are essential (Municipality of The Hague, 2017).

Table 23: ambitions and the relevant principles of the goal to make The Hague a city with a future-proof housing stock (Municipality of The Hague, 2017)

Ambition 1	
The housing stock meets the requirements for sustainability by 2030.	
	By fulfilling maintenance needs
	50% of dwellings are heated with non-fossil fuel heat source
Ambition 2	
Improving and diversifying the supply of suitable housing and forms of residential care for independent living by 2030.	

Discussion of results step 1

Of the 26 buildings, three are discounted from the stock. Firstly, the building on the Rijswijkseweg 60 (see image below) has been granted a permit for demolition already. Next to that, the building on the

Prinses Beatrixlaan 23 has also been issued a permit for renovation, which means that this building is already being invested in at the moment (Vastgoeddata, 2023). Thirdly, the building on the Spaarneplein 2 has also been discounted given the fact that the municipality of the Hague envisions this building being transformed into an international knowledge centre for sustainability in order to stimulate the further development of the neighbourhood (Municipality of The Hague, 2015c). This leaves 23 buildings over, as can be seen below. Currently, the areas with the most potential for densifying are located around the CID and the Binckhorst area, as the municipality is actively interested in upgrading and densifying the functions in these areas. The primary target groups the municipality wants to provide dwellings for in the coming years are young urban professionals, urban families, empty nesters, expats, and students.

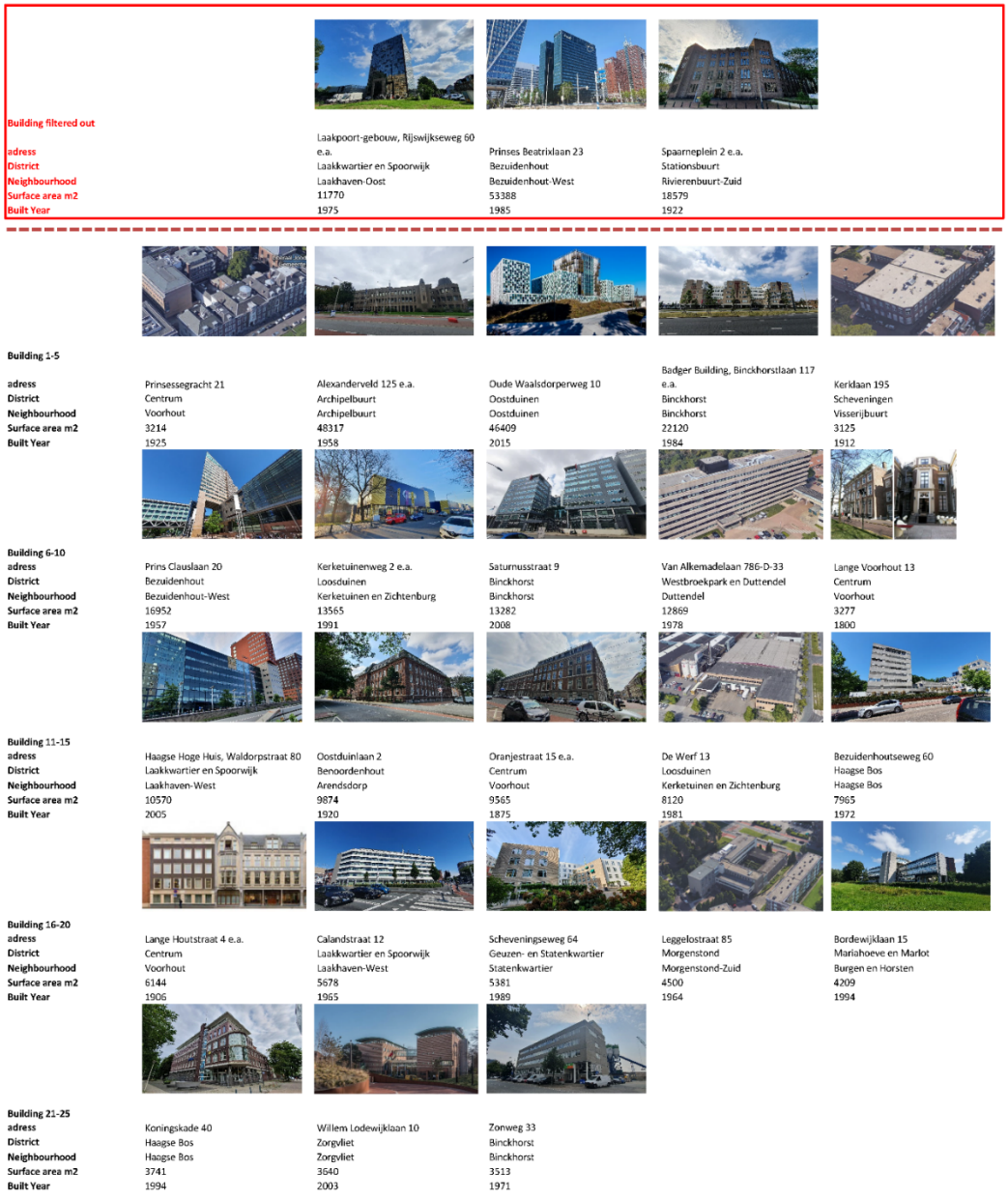


Figure 38: Overview of three buildings filtered out because other interventions have already taken place or the municipality envisions another function than dwellings for the building (own image based on data from Municipality of The Hague (2015c); Vastgoeddata (2023))

1.15 Step 2a: Feasibility scan using gradual criteria at the location level

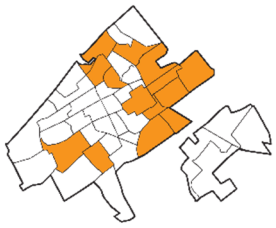
As mentioned, 23 buildings will be analysed on a location and building level to determine their transformation potential. The different neighbourhoods are described using a few metrics. Firstly, to get a vision of the different neighbourhoods, the liveability circle of each neighbourhood is used. Liveability circles give an impression of how a neighbourhood scores compared to the average of all neighbourhoods in The Hague based on specific metrics regarding liveability (e.g., crime, nuisance, housing). The data used to create the liveability circle is compiled from the research 'Prettig Wonen in Den Haag', the 'Leefbaarometer' and conversations held with neighbourhoods. The analysis of the buildings on a location level is moved to the

Appendix A.

Discussion of results feasibility scan on the location level

Table 24: Overview of 23 buildings divided by the district and neighbourhood in which they are located (own table)

# of buildings	District	Neighbourhood	Square meters	
1	Bezuidenhout	Bezuidenhout-West	16952	m2
1	Archipelbuurt	Archipelbuurt	48317	m2
3	Binckhorst	Binckhorst	38915	m2
2	Laakkwartier en Spoorwijk	Laakhaven-Oost and Laakhaven-West	16248	m2
2	Loosduinen	Kerketuinen en Zichtenburg	21685	m2
2	Haagse Bos	Haagse Bos	11706	m2
1	Mariahoeve en Marlot	Burgen en Horsten	4209	m2
1	Zorgvliet	Zorgvliet	3640	m2
4	Centrum	Voorhout	22200	m2
1	Benoordenhout	Arendsdorp	9874	m2
1	Scheveningen	Visserijbuurt	3125	m2
1	Morgenstond	Morgenstond-Zuid	4500	m2
1	Geuzen- en Statenkwartier	Statenkwartier	5381	m2
2	Westbroekpark en Duttendel	Duttende	59278	m2
Total 23 buildings in 14 districts			**266030**	m2



Most of the 23 buildings are in the city centre or the neighbourhoods surrounding the city centre. Below is a discussion of the analysis on a location level.

The quality and proximity of amenities

The figure below shows buildings that scored well on the quality and distance to facilities, whilst buildings marked red are in areas that scored poorly on the quality and distance to facilities. The buildings located in Binckhorst and the western part have the least facilities to support activities related to the function of living. To illustrate, Binckhorst has many industrial and office functions but lacks basic facilities such as supermarkets, attractive public spaces, and schools. Although this area is designated as a transformation area, meaning the transformation of the mix of functions is stimulated, including the addition of housing and supporting facilities, the area does not yet meet the needs of dwelling users. Next, the buildings in the western part of the Hague are far from facilities like train stations, schools, and the city centre.

Figure 39: Buildings marked green are in areas which score well on the quality and distance to facilities, whilst buildings marked red are in areas which score poorly on the quality and distance to facilities (own image)

The influence of target groups

The facilities' quality and proximity depend on the potential target group housed in an area. For example, the use and ownership of cars are highly dependent on the phase of life of the potential target group. The start or end of a phase of life (e.g., first job, moving in together, birth of the first child, divorce, retirement, death of a partner) often influences the choice to buy or discard a car (Zijlstra et al., 2022). For example, markers like the proximity to parking depend on the users' life phase. To illustrate, someone who must do groceries for a family might be less willing to rent or buy a dwelling if the parking space is not in front of their dwelling. Alternatively, the concept of shared cars seems to be more popular amongst young people compared to families with kids[4]. Young people are also often more dependent on public transport and value proximity to public transport hubs more as their financial situation is not stable enough for car ownership (Zijlstra et al., 2022). Furthermore, proximity to basic medical facilities is essential but can be considered more critical for older target groups than youngsters[4].

The liveability of the neighbourhoods

The liveability of a neighbourhood is dependent on the needs of the target group and factors such as a sense of safety and the quality of public space. For this, the neighbourhoods were compared to the averages of The Hague. It can be noted that the Morgenstond, Laakkwartier Spoorwijk, Stationsbuurt, Zorgvliet, Westbroekpark/ Duttendel, Scheveningen and Centrum score below average on safety compared to other neighbourhoods in The Hague. This is based on markers such as the number of robberies, high-impact crimes, violent crimes and reports of nuisance caused by youth, other people, and other types of nuisances (e.g., noise, drugs). Next to that, Morgenstond, Laakkwartier Spoorwijk, Stationsbuurt, Loosduinen, Centrum, Binckhorst and Mariahoeve en Marlot also score below average on social liveability markers compared to other neighbourhoods in The Hague. This includes markers such as social cohesion in the neighbourhood, the degree of loneliness experienced by persons older

4 B. Eekels, personal communication, June 15, 2023

than 19 years old living there, and proportions of persons aged 19 years and older with good/very good general health and who meet exercise guidelines. Lastly, Stationsbuurt, Scheveningen, and Westbroekpark/ Duttendel score below average on physical liveability markers. This includes Environmental markers such as the proportion of areas with more than 10 cm of flooding and markers such as reports of squalor, the quality of the public space, the distance to a general practitioner, schools, and other daily food stores.

1.16 Step 2b: Feasibility scan using gradual criteria at the building level

The 23 buildings will be analysed on a building as well. Different online sources were used to collect data on the buildings. Google (Images) was used to collect historical and visual information of the buildings. Ruimterlijke Plannen was used to gather data on the zoning plan. Sites such as Monumentenzorg Den Haag were accessed to gather data on the monumental status of buildings in The Hague. Open Street Map was used to produce rough measurements of the buildings. Vastgoed Data was used to gather information on the built year, building size, energy label, building owner and pictures of the buildings. Kadastrale Kaart was used to look at the boundaries of the plots. The analysis on a building level is moved to the Appendix B. Next, expert interviews were held. This exercise aimed to calibrate the results of the analysis executed previously using the insights of developers involved in the transformation process.

Discussion of results feasibility scan on the building level

In this segment, observations of the group of buildings which were analysed will be presented. The goal of the paragraphs below is to compare the buildings with one another and to provide an explanation for peculiarities noticed in the scoring. A few observations can be made about the buildings found in The Hague, as well as the adaptability of these buildings. These points will be discussed below and are divided into the following groups:

1. Not all office environments in The Hague represented
2. Area redevelopment needed
    a. Buildings found in the Binckhorst;
    b. Buildings found in the ZKD business park;
    c. Buildings found in the Frederikkazerne;
3. Ownership of buildings and status of buildings
    d. Buildings owned by the Dutch government or other governmental agencies;
    e. Partly monumental buildings;
    f. Buildings which are currently already being (re-)developed;
    g. Identity neighbourhoods and new target groups;
4. Consequences of the building shape;
    a. Internal circulation and lost square meters
    b. The size of the project and the type of client needed

Not all office environments in The Hague represented

In the chapters above, the different office environments of the Hague have been discussed. After the initial filtering to provide a stock of buildings (step 0), it could be noted that no buildings out of the office environments located in the district of Leidschenveen-Ypenburg were selected. Next, most

office environments are concentrated around the city centre of The Hague, HS station, and The Hague Central Station. This is also reflected in the fact that most buildings found are in and around the city centre and the two stations.

Figure 40: Map showing the location of the buildings as well as the transformation classes

The picture above shows the buildings colour-coded according to their transformation class on the map of The Hague. It can be noted that the farther from the city centre the building is, the lower the transformation class is. The city centre of the Hague is serviced by two train stations (The Hague HS and Central station of The Hague). Next to that, the city centre has a higher concentration of relevant facilities present. Thus, buildings located around the city centre scored highly.

Area redevelopment needed - buildings found in the Binckhorst

Three of the buildings are in the Binckhorst (see figure below). What stands out about all three of these buildings is that the layouts of these buildings could be reused for a different function (e.g., clear circulation through the building, elevators and staircases present, lots of windows, decent size). This is because these buildings are relatively new and built initially as office buildings. This means that these buildings are equipped with features also needed for housing.

However, the appearance of the buildings to their surrounding environment lowers the attractiveness for the function of housing. In the case of the building along Zonweg 33, for example, the asphalt factory behind the building is a nuisance and would make the transformation to housing impossible. The building along the Saturnusstraat 9 and its direct surroundings looks like a typical office building in a street of office buildings and lacks the appearance of a residential building/area (e.g., lacks greenery, a tall gate protects the building). Buildings in this area will only become interesting if the surrounding areas are redeveloped to make the project attractive. Next to that, the infrastructure in this area is heavily geared towards cars. The Rotterdamsebaan is a road which connects the A4 and A13 with the S100 (ring road surrounding The Hague). The largest part of this road is made of the Victory Boogie Woogietunnel, which starts in the Binckhorst. This route is vital for the traffic from and towards Rotterdam, Delft and Ypenburg. This road is also vital for alleviating traffic from the Utrechtsebaan. Thus, the consequences of this road should be considered when considering building in this area.



Figure 41: Buildings located in the Binckhorst area in order of appearance Zonweg 33, Binckhorstlaan 117, Saturnusstraat 9

Area redevelopment needed - buildings found in the ZKD business park

Two of the buildings are in the ZKD business park (Zichtenburg-Kerketuinen-Dekkershoek). This business park is approximately 80 hectares and holds space for around 400 companies. In this area, the buildings, although labelled as offices, are designed for businesses that need large spaces for industrial, logistical, or warehousing purposes. Thus, these buildings are characterised by their large footprint and facades, predominantly closed off and with few windows. The buildings are relatively low (compared to those found in the Binckhorst), but the internal spaces are very deep. Lastly, these buildings are not architecturally attractive.

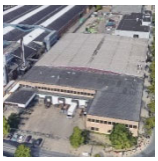
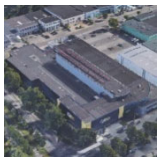



Figure 42: Buildings located in the ZKD business park in order of appearance De Werf 13 and Kerketuinenweg 2 (Google Earth, N.D.)

Area redevelopment needed - building found in the Frederikkazerne;

The building along the Van Alkemadelaan 786 D33 is situated within the Frederikkazerne, a military Barack still in use near Scheveningen. On the grounds of this barrack, the administrative staff of the Ministery of Defense, which is responsible for making policy for the Department of Defence, is seated. Next to that, the NIMH- Netherlands Institute of Military History- is also situated here. It is a knowledge and research centre for Dutch military history, providing publications, education, and archives records. Next to that, the Militaire Inlichtingen- en Veiligheidsdienst (MIVD) is also located on the premises of the Frederikkazerne as well as the "Dienst der Hydrografie", which is a part of the royal navy tasked with informing seafarers about the waterways, the seabed, and underwater dangers (e.g., shipwrecks) by producing nautical charts, taking depth measurements, etcetera (Ministerie van Defensie, N.D.). Thus, to do anything with this building, the current function of the whole Barack would have to be discontinued, and the area would need to be transformed along with this building. There used to be another barrack next to the Frederickkazerne- the Alexanderkazerne built in 1938- however, in 2012, this barrack was demolished and made a place for the International Court of Justice (ICC)- which is also one of the buildings which were analysed in this document.

Figure 43: Buildings located in the Frederikkazerne (Van Alkemadelaan 786 D33)(Google Earth, N.D.)

Ownership and status of buildings

Buildings owned by the Dutch government or other governmental agencies

As mentioned in previous chapters, The Hague is where the Dutch government and parliament are situated; next, the city is profiled as the International City of Peace and Justice, shaping the city's development. Accordingly, several buildings are owned by the Central Government Real Estate Agency (Rijksvastgoedbedrijf in Dutch) or used for functions relevant to the city's international profile (e.g., embassy). These buildings owned and used by governmental agencies can be seen in the table below. These buildings will only become interesting if the governmental agency decides to relocate to another building, such as the previous police headquarters. Especially for embassies, this is a rare occurrence.

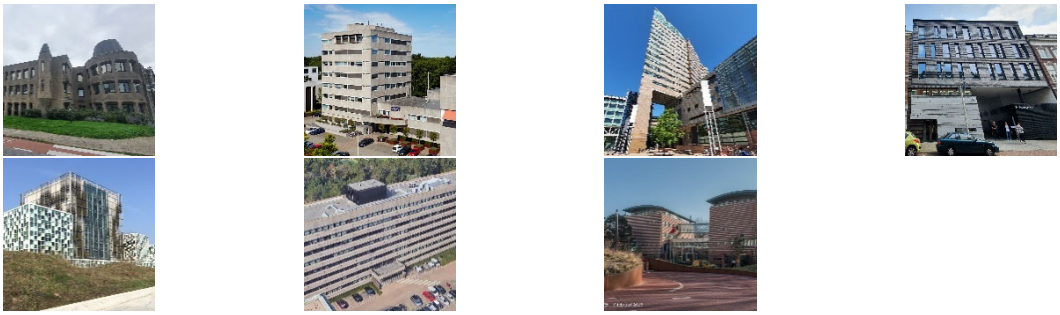


Figure 44: Buildings owned by the government in order of appearance: *Previous police headquarters (Alexanderveld 125), Social and Economic Council (Bezuidenhoutseweg 60), Palace of Justice (Prins Clauslaan 20), Raad van State (Oranjestraat 15), International Criminal Court (ICC) (Oude Waalsdorperweg 10), The Frederikkazerne (Van Alkemadelaan 786) and Embassy of the People's Republic of China (Willem Lodewijklaan 10).*

A part of the real estate strategy of the Central Government Real Estate Agency is to divest all real estate which is no longer being used for state purposes. In the past, the Divestment strategy of the Central Government Real Estate Agency has consisted of four categories (Rijksvastgoedbedrijf, 2015):

Category 1: Current function
This category is assigned to buildings in the portfolio that can be sold relatively quickly in their current condition for a function that aligns with the current zoning plan. This mainly entails land.

Category 2: Transformation
The Central Government Real Estate Agency aims to consult with the municipality about changing the zoning plan in cases where the current function makes selling the building successfully less viable to make the project more marketable.

Category 3: complex transformation
The Central Government Real Estate Agency sees consulting with the municipality to change the zoning plan as necessary, as the current function makes selling the building successfully impossible.

Category 4: Area (re)development
For properties that are too large-scale, too complex, or too risky to put on the market, the Central Government Real Estate Agency aims to pursue an area redevelopment strategy in which the whole area or parts of the area are on the market.

The main challenge for the Central Government Real Estate Agency when it comes to the three last categories is to provide these buildings with a new function which is in line with the needs of the area they find themselves in in such a way that they can add value to the local economic development of the neighbourhood (Rijksvastgoedbedrijf, 2015). In a publication of the Rijksvastgoedbedrijf (2015), in which past projects were discussed, it was mentioned that approximately 0-5% of the real estate divested is found in category 1, between 10-15% of the real estate divested can be found in category two whilst between 70-80% can be found in category three and lastly approximately 1-2% can be found in category 4. Thus, most buildings divested by the Central Government Real Estate Agency are complex transformation projects.

Partly monumental buildings

After more research, four buildings (see below) in this stock were found to have protected elements because of their architectural relevance. This fact was discovered after looking up more information about the buildings. In three of the cases (Prinsessegracht 21, Lange Voorhout 13 and Lange Houtstraat 4 and 8), these buildings are found in the city centre of the Hague and on the plots, two structures are built- a more modern office building and an older building which is listed as a monument (e.g., due to the façade being of architectural relevance). It is unclear why these three buildings still made it through the filters used on Vastgoeddata.

In the case of the building along the Alexanderveld 125, the oldest part is a municipal monument, whilst the later edition is not. A municipal monument is less of an issue compared to a listed monument. Next to that, the non-monumental part of this complex is compared to the monumental part of a larger size, meaning that even if the monumental part is kept as office space, still enough dwellings can be delivered.

For these buildings, filling in the table "feasibility scan using gradual criteria at building level" is more difficult as these buildings consist of two buildings built in different periods with different features. The facades of the buildings along the Prinsessegracht 21 and Lange Voorhout 13 are nationally listed monuments. This negatively impacts the adaptability of the building. Next, the functionality of the building is also impacted as less is possible (e.g., on one of the buildings, a fire escape staircase is added onto the façade because it could not be retrofitted inside the building).

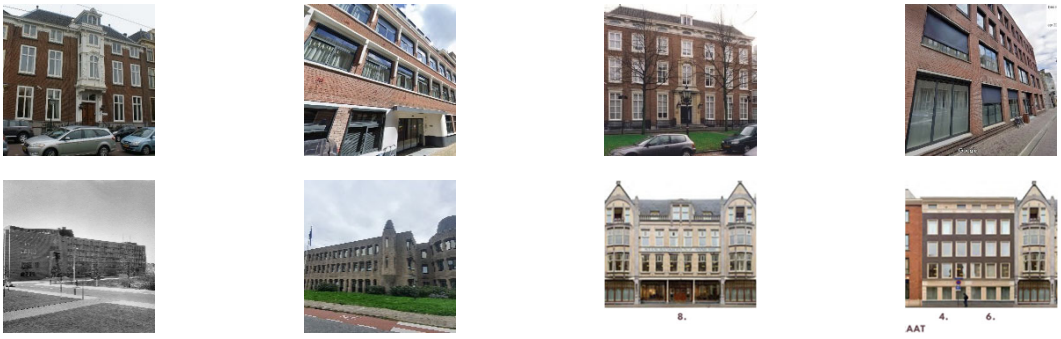


Figure 45: Listed monumental façade of building along the Prinsessegracht 21 as well as the façade of other building on the same plot (pictures 1 and 2), listed monumental façade of building along the Lange Voorhout 13 *as well*

as the façade of other building on the same plot (pictures 3 and 4), municipal monument of building along the Alexanderveld 125 as well as later edition built next to the building (pictures 5 and 6) and listed monumental façade of building along Lange Houtstraat 8 as well as Lange Houtstraat 4 next to it (pictures 7 and 8) (Municipality of The Hague, 2022b)

Possible Solution

In practice, transforming buildings like these can be more attractive if a property division permit (Splitsingsvergunning woning in Dutch) is requested. A property division permit is a permit that the building owner can request to change the Cadastral registration of the property. By doing so, the different building parts are named separately and provided with a serial number in the Land Registry. Thus, parties interested in transforming the (non-monumental) building can negotiate with the building owner that they will take on the project under the condition that the building owner requests a property division permit.

Buildings which are currently already being (re-)developed or renovated

There are two buildings which were later found to be in the process of being redeveloped. Firstly, as mentioned previously also, the building along the Prins Clauslaan 20 is owned by the Central Government Real Estate Agency and is planned to be renovated to upgrade the functionality of the office spaces and work areas, implementing sustainable measures for the future functioning of the building and to connect the building parts into one large complex. The goal is to renovate the building to the level of a new building. The building along the Lange Houtstraat 4 and 8 is part of a larger complex named Complex Staal. It is also being transformed into a mixed-use complex (e.g., a mix of offices, dwellings (rental segment), hospitality, museum, debate facilities, and parking). It is owned by Syntrus Achmea Real Estate & Finance. Thus, these buildings are no longer suitable for transformation as disinvestments would be made.

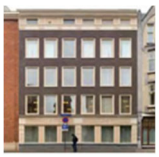


Figure 46: Buildings for which plans have been made to redevelop in order of appearance- Prins Clauslaan 20 (Vastgoeddata, N.D.)and Lange Houtstraat 4 and 8 (Municipality of The Hague, 2022b)

Identity neighbourhoods and new target groups

The six buildings which scored most suitable for transformation to a residential function are in the following neighbourhoods in the North-East of The Hague: Zorgvliet, Haagse Bos, Statenkwartier, Benoordenhout and Archipelbuurt. These neighbourhoods have similar profiles. Most residents in these neighbourhoods are between the ages of 20 and 64. Most of these residents live in apartments, and most dwellings in these neighbourhoods are in the owner-occupied segment. In Haagse Bos, Benoordenhout and Archipelbuurt, most households are single-person, while most households in Zorgvliet and Statenkwartier are couples cohabiting without children.

Table 25:neighbourhood profiles where six buildings deemed most likely to be transformed are found

Predominant	Age group			Dwelling type		Ownership			Household composition			
	<19	20-64	65>	Single person dwelling	Appartements	Owner-occupied	Social rent	Private rent	Single-person households	Cohabitating without children	Cohabitating with children	Single-parent households
Zorgvliet		47,3%			85,2%	71,2%				42,1%		
Statenkwartier		58,7%			68,4%	59,0%				68,4%		
Haagse Bos		51,7%			98,6%	71,1%			56,8%			
Benoordenhout		50,1%			69,6%	72,9%			43,5%			
Archipelbuurt		58,8%			72,0%	56,5%			54,2%			

Simultaneously, buildings in office environments, such as the International Zone, have their own identity (e.g., a cluster of international organisations with supporting facilities for these international organisations, such as international schools). New residents would need to add value to the existing identity of these neighbourhoods. Reluctant neighbours could object if they see the introduction of a new target group as a threat. An example of a project which dealt with this issue is the transformation of DC van Hallen. The residents filed a lawsuit against the office building's change, citing potential (noise) nuisance by the students. As a result, the residences were designed with smaller windows and no balconies, among other things. The lawsuit caused the project to be delayed (Mooyman, 2019).

Consequences of the buildings' shape

Internal circulation and lost square meters

Some of the office buildings were designed with features which are attractive to office users (e.g., large common areas and assembly rooms). However, the ratio between the rental floor area (RFA) and unrentable space- or gross floor area (GFA)- is more critical for residential projects. These spaces are not attractive for housing projects given that the costs of (servicing) these spaces (e.g., heating, cleaning, and maintenance) are added up in the service costs and divided amongst all the residents. Thus, this could result in high service costs for the potential renters, making the dwellings less attractive. Some of the buildings found were deemed less attractive because of this feature. For example, the building along the Waldorpstraat 80 consists of multiple structures covered by a glass structure providing internal common spaces. Because of its shape, the building along Bordewijklaan 15 would also require long hallways to access the hypothetical dwellings, meaning much space would be lost to circulation. The same can be said for the building along the Oude Waalsdorperweg 10, which has several courtrooms because of its current function.

The size of the project and the type of client needed

Most of the 26 buildings were larger than 5.000m² (table below). There were two buildings for which the feasibility was deemed challenging to predict due to the large size of the project (Alexanderveld 125 and Oude Waalsdorperweg 10). This is due to a few reasons. Partly, due to the function of the buildings, the internal structures are not easily retrofitted for housing. For example, Oude Waalsdorperweg 10 has multiple courtrooms, and to use these spaces efficiently, new floors would have to be added to produce floor heights that align with the wishes of housing and not waste the number of square meters. Next to that, the size of these projects brings inherent risks with them, which the client would have to be able to carry. Typically, these risks are minimised by, for example,

transforming the building into a mixed-use complex and by finding a client who is interested in projects of this size (e.g., The Campus of Diemen Zuid, which is also a project of significant size, is an example of a project in which there was one client who took on the redevelopment of the whole building and also actively added facilities in the area to make the project more feasible).

Table 26: Building sizes of the 26 buildings

By size, all 26 buildings	<5.000m²	5.001-10.000m²	10.001-15.000m²	15.001-20.000m²	>20.001m²
# buildings	8 Buildings	7 Buildings	5 Buildings	2 Buildings	4 Buildings

1.17 Step 3: Determination of conversion potential class

Below follows an oversight of the transformation class per building because of filling in the feasibility scan using gradual criteria at a building and location level. The transformation class is divided into the following five categories:

Class 1: No transformation potential
Class 2: Hardly any transformation potential
Class 3: Limited transformation potential
Class 4: High transformation potential
Class 5: Excellent transformation potential

The maximum score a building can receive for the gradual criteria on a building level is 84, and the maximum score that a building can receive for the gradual criteria on a location level is 175. The feasibility of buildings that score in classes 4 and 5 can be further analysed, although that is outside the scope of this research. The table below shows the conversion classes of the 26 buildings ordered by their transformation class (own table). Approximately 43% of the stock of buildings analysed in The Hague was deemed to have transformation potential based on the results of the Conversion Meter (9 out of 21 buildings).

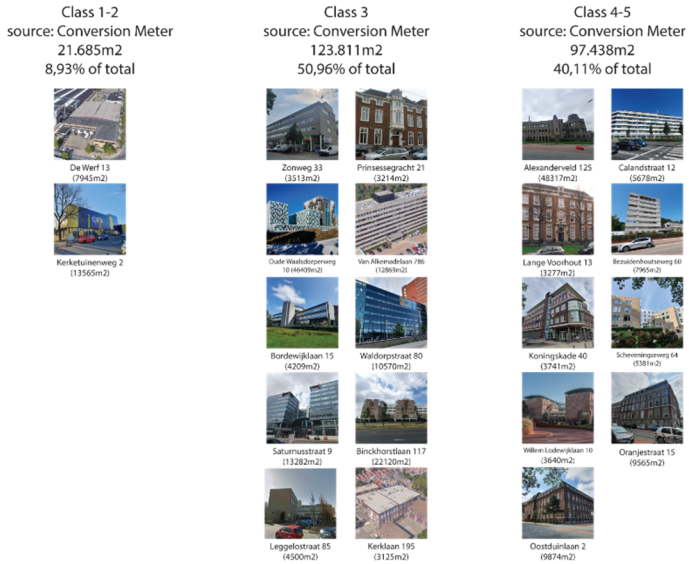


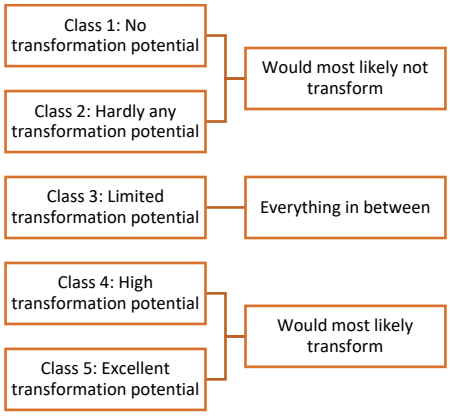
Figure 47: Overview of division of buildings across the transformation classes based on analysis (own image)

1.18 Discussion of results interview with expert interviews

The buildings were grouped and presented to developers at Van Wijnen, who were asked to pick two buildings from each group: one with no transformation potential and one they considered to have the most potential. Consequently, they were asked to also rank the three remaining buildings in the group of five based on the potential they saw in them. The groups of five were ordered randomly. The developers were given two a4 sheets per building. The sheets contained basic information regarding the appearance of the building, the built year, the size of the building, the energy label, the status of the zoning plan, the monumental status of the building, a table showing the distance to several facilities relevant for the function of housing, and the location of the building in relation to the rest of the city of The Hague (see Appendix C for an example of the sheets).

The scores the buildings receive are unique to the building's characteristics and not in comparison to other buildings. To illustrate, two buildings can technically have the same score. However, the building for which a façade can easily be reused might be favoured as this could mean that the building has an appearance which is in line with the expectations of residential buildings, or this could save on expenses and make the process easier. Thus, this chapter aims to capture these types of nuances. The ranking done by the developers can be found in Appendix D, and the chart below shows how the results of the interviews are compared to the results of the analysis in the previous chapter. Below, the buildings deemed most likely to be transformed and most likely not to be transformed are discussed.

Figure 48: Three categories used to order buildings by the developers interviewed and how they compare to the categories of the Conversion Meter (own image)



Would most likely not transform

The table below shows the buildings which, because of the interviews, were deemed to have the least amount of transformation potential. There is much overlap in the opinions of the buildings selected as the least likely to be transformed.

Table 27: Buildings which were voted the least likely to be transformed by the developers (the buildings are displayed in a random order) (own table)

In order of appearance: Kerketuinenweg 2, Zonweg 33, De Werf 13, Bordewijklaan 15, Van Alkemadelaan 786, Prins Clauslaan 20, Oude Waalsdorperweg 10

Kerketuinenweg 2: not much to work with

The building along the Kerketuinenweg 2 was deemed most likely not to be transformed as it is in an unappealing area for dwellings, and the building itself is unsuitable for housing.

Zonweg 33: Area redevelopment needed

A few projects were selected easily, which could easily be executed without too many complications. The buildings along the Zonweg 33 and Van Alkemadelaan 786 are examples of such buildings. The reason is that these buildings have a very straightforward shape, with a clear entrance, which provides access to the rest of the building, and this layout is repeated across multiple storeys. Finding a layout which fits in buildings such as these is relatively easy. These buildings are not particularly aesthetically pleasing but could be transformed relatively quickly. However, as mentioned above, this building is located next to an asphalt factory, which is not attractive for housing.

De Werf 13: Not in a suitable area

The building along De Werf 13 was deemed most likely not to be transformed as it is in an unappealing area for dwellings, and the building itself is unsuitable for housing.

Bordewijklaan 15: A lot of square meters lost to internal circulation

The building along Bordewijklaan 15 was deemed most likely not to be transformed as it is incredibly long. This building was designed with attractive features for office users (e.g., large common areas and tall rooms). The access to dwellings which could theoretically be built would have to be arranged through long hallways. This means that many square meters would be lost to internal circulation instead of turned into rentable space. Thus, these spaces are not attractive for housing projects given that the costs of (servicing) these spaces (e.g., heating, cleaning, and maintenance) are added to the service costs and divided among all the residents. Thus, this could result in high service costs for the potential renters, making the dwellings less attractive.

Van Alkemadelaan 786 d33: located on private property

The building along the Van Alkemadelaan 786 d33 was deemed most likely not to be transformed as this building is located on private property used by the Ministry of Defence. Unless the whole area is discontinued, it is impossible to reuse this building, even though it has great potential.

Prins Clauslaan 20: already being renovated

The knowledge that there are plans for this building to be renovated to the level of a new building to facilitate the execution of its current function is why this building was deemed uninteresting for further exploration compared to the other buildings.

Oude Waalsdorperweg 10: too large

The building along the Oude Waalsdorperweg 10 was deemed most likely not to be transformed as it is relatively new, and transforming it would lead to many disinvestments. Secondly, the scale of the building and the location do not invite transformation into dwellings. Finding an investor interested in transforming a building of this scale and located in this neighbourhood into dwellings is small.

Would most likely transform

Below is an overview of the buildings deemed most likely to be transformed and the reasoning for each. Less overlap can be noted in the buildings selected most likely to be transformed.

Table 28: Buildings which were voted the most likely to be transformed by the developers (the buildings are displayed in a random order) (own table)

Would most likely transform


In order of appearance: Oostduinlaan 2, Willem Lodewijklaan 10, Koningskade 40, Alexanderveld 125, Saturnusstraat 9, Scheveningseweg 64, Leggelostraat 85, Bezuidenhoutseweg 60, Van Alkemadelaan 786

Oostduinlaan 2: The impact of similar reference projects

The building along Oostduinlaan 2 was likely to be transformed due to the building having a distinctive appearance. Next to that, the developer also pointed out that the building resembles two other recently transformed buildings, which can be seen in the figure below (e.g., both buildings are of a similar size and have a distinctive façade made from dark bricks). The Plesmanduin was the headquarters for KLM before it became a residential building housing 152 units, of which 72 are owner-occupied apartments, 17 are designated for expats, and 63 are designated for young professionals. Next to dwellings, the building is also partly a hotel with a restaurant (Van Wijnen, N.D.-b). On the other hand, De Meester was a vocational school from the '20 in Haarlem with historical value with later extensions added in the 1950s. This building was transformed into a modern residential building, along which a new building was added. One hundred seventy-eight units were developed in the mid and private rental segment (Wonen bij Bouwinvest, N.D.). The ability to see the potential of the building through the successful transformation of a building with a similar appearance is one of the reasons why this building ended up in this category.

Figure 49: Reference projects with similar features are given as an example of why this building is deemed attractive. the project Plesmanduin in the Hague and De Meester in Haarlem (Van Wijnen, N.D.-b; Wonen bij Bouwinvest, N.D.)

Willem Lodewijklaan 10: The building looks straightforward

The building along Willem Lodewijklaan 10 was likely to be transformed due to the building having a functional layout (a central entrance providing circulation to two wings), which could easily be repurposed for the function of housing. Furthermore, the building is of a decent size in a green environment and looks well-kept.

Koningskade 40: The building has a clear structure

The building along Koningskade 40 was likely to be transformed because of its distinctive appearance and clear structure. A clear grid of windows makes it possible to make a logical division in the building (e.g., three windows per apartment) and to repeat this across the different floors.

Alexanderveld 125: The building has a nice grid and many windows

The building along Alexanderveld 125 was likely to be transformed because the building has a distinctive appearance, which is attractive for the residential function. However, the project size makes it so that a specific client would have to be interested in realising such a project. Moreover, the area also must support such an increase in residents, which means the necessary facilities must be present (e.g., sufficient parking). The project Campus Diemen Zuid was used as an example because it also consisted of transforming multiple buildings on the former office park Diemervijver (which dealt with many vacancies) into a student campus providing approximately 936 units. The introduction of so many units at one time was facilitated by the development of facilities in the plinth of these buildings to support the residents (e.g., a supermarket was added, an indoor sports venue, as well as a tennis court, was added, several restaurants and bars also were added (Van Wijnen, N.D.-a).

Figure 50: The redevelopment project Campus Diemen Zuid executed by Van Wijnen delivered 936 units in combination with the development of facilities in the plinth to introduce this number of new residents into this neighbourhood. The willingness of the client to also provide these facilities made this project feasible (Van Wijnen, N.D.-a)

Saturnusstraat 9: modern enough that the building can be easily retrofitted

The building along Saturnusstraat 9 was likely to be transformed because the structure of the building appears to be clear and has the necessary means (e.g., sufficient circulation area, staircases, and lifts) to be easily retrofitted. However, it was also pointed out that the façade of the building might have to be replaced because it does not look like a residential building.

Scheveningseweg 64: The target group can be easily envisioned

The building along Scheveningseweg 64 was likely to be transformed because the developer could easily envision transforming a building with such characteristics into a residential building for senior citizens. The building is located closer to the beach, in a very green environment and on a plot with privacy was seen as added value. The fact that the façade of the building looks well-kept and modern

and can most likely be reused was also viewed as an added value. Such features also allow for such a building to be marketed outside the social segment, as potential users would be willing to pay more.

Leggelostraat 85: building in a residential area which could be topped up

The building along Leggelostraat 85 was likely to be transformed because, firstly, the building is in a primarily residential neighbourhood. Next to that, the building looks like some parts could easily be topped up because there are taller buildings in the vicinity, and topping up the building would not produce issues for surrounding buildings when it comes to daylight. However, the building consists of many different parts, and each part must be customised.

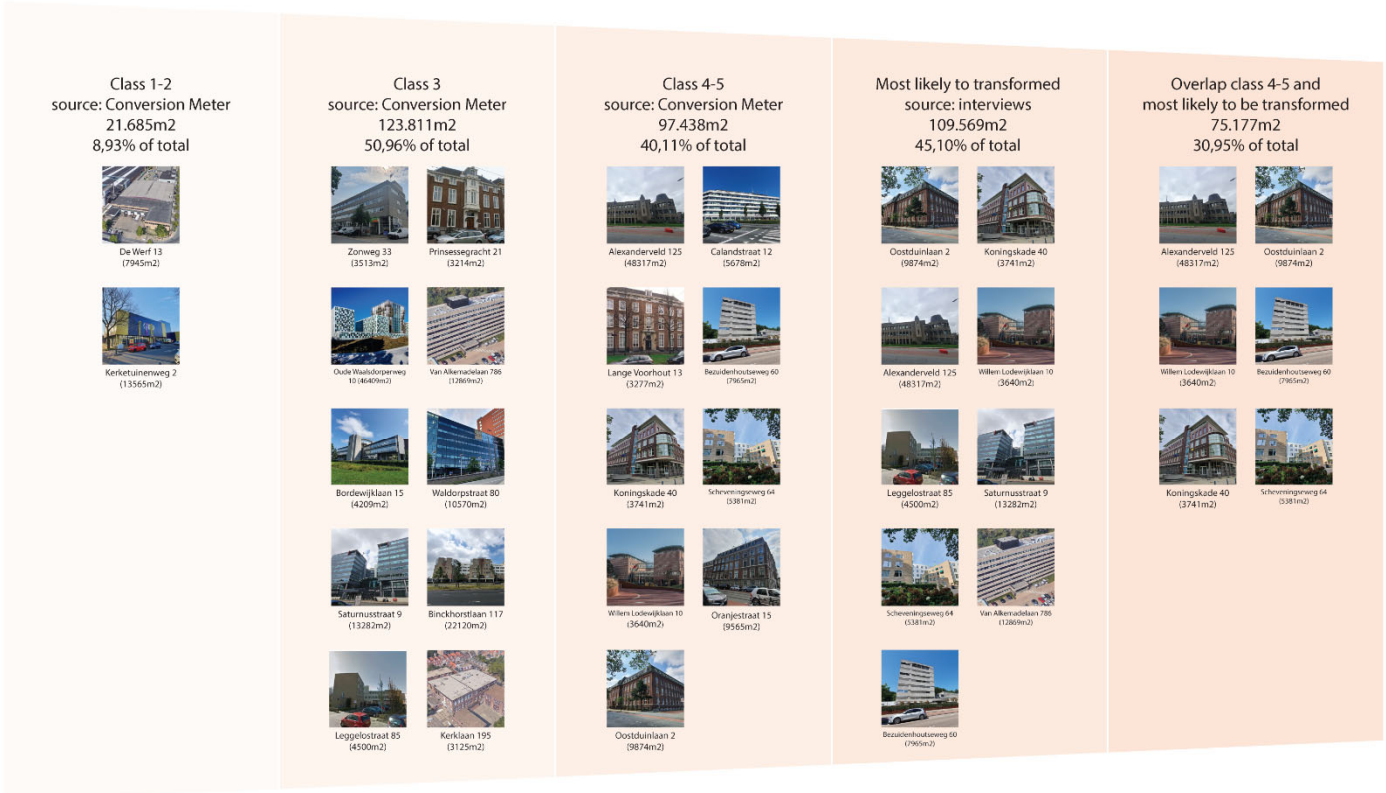
Bezuidenhoutseweg 60: building in which could be topped up

The building along Van Alkemadelaan 786 was deemed likely to be transformed by one of the developers because of the potential to top the building up with a wooden construction, as buildings from the 70s often were over-dimensioned.

Van Alkemadelaan 786: cookie cutter building

The building along Van Alkemadelaan 786 was deemed likely to be transformed because it was considered an "easy" building. Easy refers to the building having a clear entrance and circulation system repeated across all the floors. Next, the building has a clear window grid, sufficient lifts, and staircases—all fundamental elements which can, in theory, easily be reused.

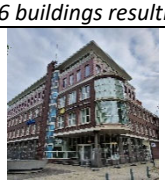
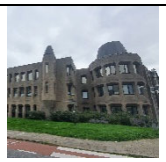
349.767m2 of which 5 were discounted leaving 242.934m2 over in total



Introduction part 4

This part of the document focuses on how transforming this building stock affects the number of dwellings delivered through conversions each year. Six buildings were selected (approximately 29%) because they were classified with conversion class 4 or 5, and the developers interviewed selected them as most likely to be transformed. Those buildings can be seen in the table below. Different aspects of these buildings have already been discussed in the chapters above; thus, this will not be repeated here.

Table 29: 6 buildings resulting from the last step analysis

					
Willem Lodewijklaan 10	Koningskade 40	Scheveningse weg 64	Bezuidenhout seweg 60	Oostduinlaan 2	Alexanderveld 125
3.640m²	3.741m²	5.381m²	7.965m²	9.874m²	48.317m²
Total amount of square meters				75.177 m²	
Total amount of square meters minus 25% circulation space				56.382,75 m²	
The total amount of square meters minus 25% circulation space divided by 30m² units would deliver approximately				1.879 units	

To keep up with population growth, the municipality of The Hague plans to build 4.000 new homes annually (30% social rent and 20% mid-segment rent)(Municipality of The Hague, 2022a). The primary methods for delivering this supply will be new construction in vulnerable neighbourhoods, transforming existing real estate, and densifying the city centre. The municipality has not clarified how many dwellings should be delivered through transformation; however, assuming the national goal of 15%, it would mean that 600 dwellings would have to be realised through transformation per year. In that regard, the 1.879 units described above are not sufficient. One of the reasons for this is because one of the buildings- Alexanderveld 125- is responsible for more than half of the number of square meters. The paragraph below explores if more buildings can be found if the filters were changed.

Discussion of filters used and results

Numerous measures can be taken to improve the energetic performance of a building. The degree to which the roofs, walls and floors are insulated determines to what degree the building must be heated in the colder months and cooled in the warmer months. Similarly, the efficiency of the glazing also determines the degree of heat which escapes the building. The system that controls the heating and cooling in the building and the air treatment system also has an impact on the energy performance of the building. Lastly, the type of lighting used (e.g., LED lighting, presence of motion detectors) also has a significant impact on the energy performance of the building. Most measurements implemented to upgrade the energy performance have an impact on the *services layer* of the building as well as on the *skin layer*. The service layer of buildings relates to installations relating to the building's heating, ventilation, and air condition (HVAC), whilst the skin layer relates to the exterior surface of the building and how air-tight or insulated this surface is. The layer tackled during the renovation depends on how bad the energy label of the building is.

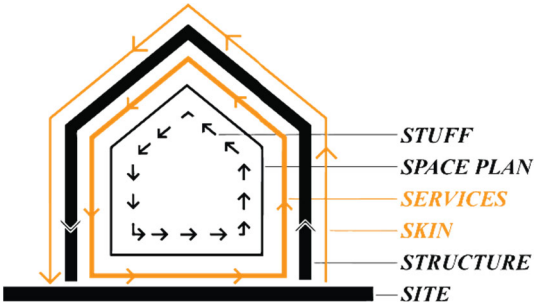


Figure 51: Energetic upgrading of buildings can be managed by upgrading the services in the building and upgrading the skin of the building. These two layers are highlighted in the shearing layers of change by Duffy and elaborated by Brand.

The following paragraph focuses on the measures needed to get utility buildings from one energy label to the next. This overview was presented in a report produced by Economisch Instituut voor de Bouw (2016). The selected measures presented in the table below were chosen based on the principle that nuisance should be minimised when works are being done, the payback periods, and the level of investments. Buildings with an energy label D or worse can be upgraded relatively quickly without any significant modifications to the structure of the building to achieve label C. To illustrate, upgrading the following installations makes a considerable difference in the energy performance of a building. Firstly, replace fluorescent and halogen lighting with LED lighting, as these lights are cheaper to maintain, last longer, and help save on energy costs. Secondly, upgrade the glass to double glazing or high-efficiency glass (HR++), as much heat escapes through the glass. This would lower the need to cool in the summer and heat in the winter, reducing energy consumption. Thirdly, add air locks (e.g., round airlock, double sliding door) at the entrance of the building to keep heat inside and further reduce the need for heating in the winter and cooling in the summer. Lastly, quick wins can be made by adding installations to regulate the temperature in the building (Vattenfall, n.d.).

Table 30: The list of measures needed to get a utility building to energy label C, B or A(Economisch Instituut voor de Bouw, 2016)

From label	Step towards C, B, A	Additional to C	Additional to B	Additional to A
G1*	-Cavity wall insulation -HR++ glazing -High-efficiency boiler -Timer on lights	-High-frequency lighting	-LED lighting	-LED lighting -Solar panels
Payback period investments		4,5 years	4,5 years	4,5 years
G2	-Cavity wall insulation -Roof insulation -HR++ glazing -High-efficiency boiler -Timer on lights -LED lighting			-Solar panels
Payback period investments		3 years	3 years	3,5 years
F	-Timer on lights -LED lighting		-Balanced ventilation with heat exchanger	-Balanced ventilation with heat exchanger -Solar panels
Payback period investments		5 years	4 years	6 years
E	-LED lighting		-Timer on lights -Solar panels	-Balanced ventilation with heat exchanger - Timer on lights
Payback period investments		5 years	6 years	4,5 years
D		-High-frequency lighting	-Solar panels -LED lighting	-Timer on lights -LED lighting -Solar panels
Payback period investments		6,5 years	5,5 years	8,5 years
C			-High-frequency lighting	-High-frequency lighting -Solar panels
Payback period investments in years				
B				-Solar panels
Payback period investments				13,5 years

*Buildings with an energy label G do not have an insulated roof. The roof of an office building is renovated approximately every 25 years. This is seen as an opportune time to insulate the roof of the building. Thus, in the table, there is a list of measures directed at buildings for which there is not a roof renovation moment planned because of the lifespan of the roof (G1) and a list of measures in which the roof's insulation is included (G2). The list of measures for G1 and G2 leads to energy label B as a list of measures including roof insulation to get to label C is more expensive than a list of measures to get to label B with roof insulation. This is due to the implementation of HR++ glazing, which is costly.

** The predicted payback periods displayed above were calculated in 2016 based on the expected energy prices 2023. Since then, there have been heavy fluctuations in the price of energy due to geopolitical reasons. Thus, the accuracy of these durations should be assumed with reservations. However, these durations indicate the relationship between the payback periods of the different investments.

The goal is to ensure that the built environment is energy neutral by 2050, and making energy label c for office buildings compulsory is the first step in that direction. The next phase is upgrading all office buildings to energy label A by 2030. Building owners must invest in the buildings to upgrade them to the necessary level. Alternatively, these investments also lead to cost savings as the building consumes less gas and electricity.

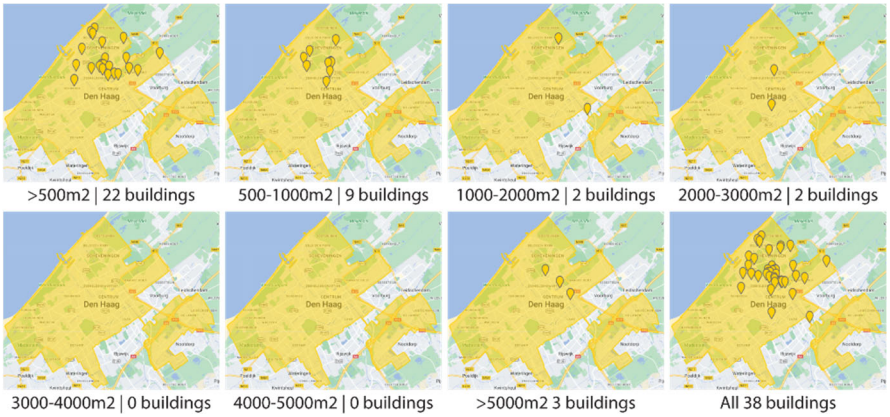
In most cases, it makes sense for the building owner to implement the necessary energy conservation measures as the payback periods are relatively short and the investments are relatively low (table above). As mentioned above, energy label C can be reached relatively easily by upgrading the installations in the building- the services layer. However, structural interventions such as adding thermal insulation, roof insulation, or HR++ glazing might also be needed to get to energy label A. This is the case for buildings with a label G. Economisch Instituut voor de Bouw (2016) estimated that approximately 70 per cent of the marginal stock resulting from the mandate to upgrade buildings will be made of properties with a label G whilst the remaining 30 per cent will be made of buildings with a label D, E, or F. The revenues relative to the investment costs necessary to get to labels C and B are higher than the revenues relative to the investment costs necessary to get to label A. On average, the revenues relative to the investment costs of the label steps to label C and B are 22% and to label A 17%. This is also visible in the expected payback periods - getting a building up to energy level A has a more extended payback period than getting the building up to energy label C (Economisch Instituut voor de Bouw, 2016).

Some building owners will have trouble financing these investments, leading to the owners choosing to sell these properties. The obligation to upgrade buildings threatens a part of the office market, with unattractive buildings characterised by poor rentability and low rents. These building owners do not have the luxury of factoring the investment costs into the rents. Demand for these buildings is low as users move to more attractive alternatives. These two factors lead to capital losses and early depreciation. Thus, one of the consequences of the obligation to upgrade the building stock is that a proportion of the stock will become economically obsolete due to the investment costs needed (Economisch Instituut voor de Bouw, 2016). To zoom in on the locations of this obsolete stock, three types of office locations are differentiated: central locations, which are near or a part of the city centre; formal locations, which are monofunctional office locations or office concentrations on business parks; and other locations, which are formed by scattered office concentration. Office buildings on the qualitative lower end of the office stock can be found across all three office locations. However, most vacant buildings are found in formal locations. Therefore, many office buildings made obsolete due to the label requirement will also be concentrated in these locations (Economisch Instituut voor de Bouw, 2016).

From the owner's perspective, the mandate to upgrade the stock of utility buildings forces building owners to critically assess the future rentability of the building before deciding on upgrading the property, as upgrading would require investments which may or may not be recoverable. This would lead to revaluing of the office portfolio. As mentioned above, attractive buildings with a good rental perspective are unaffected. The owners who typically invest in weaker office properties and are affected by the obligation to upgrade utility buildings are predominantly private investors, speculative investors, private funds, and limited partnerships. These owners- except the speculative investors- tend to have limited cash flow and tend to own " underwater " properties more often than other

players. The extent of the loss accrued would be based on the residual value of the building and or property. Another issue for these players is acquiring financing for the work that needs to be done, which might lead to the owner selling the property. The energy performance of the building is an important metric used by financiers during decision-making as this aspect is related to the rentability of the building. There is a high probability that a marketable building also has a high energy performance (Economisch Instituut voor de Bouw, 2016).

Of the 26 buildings analysed, only 3 had an energy label G, of which the building along the Alexanderveld 125 was deemed to have a high transformation potential. Few buildings with an energy label G were found in the initial stock due to the minimum size of buildings looked at (3000m²). It is noticeable that there are now 38 office buildings in The Hague with an energy label of G. But most of these structures are small. Of the 38 buildings, 22 are smaller than 500 square meters, and nine are between 501 and 1000 square meters in size. Besides, only two structures are between 1001 and 2000 m², and two buildings are between 2001 and 3000 m². The remaining three buildings are larger than 5001m². Notably, the oldest building in this stock was built in 1820, and the newest was built in 1984 (Vastgoeddata, 2023).



0-500m²	22
501m²-1000m²	9
1001m²-2000m²	2
2001m²-3000m²	2
3001m²-4000m²	0
4001-5000m²	0
>5001m²	3
Total	38

Figure 52: picture showing the dispersion of office buildings in The Hague which have an energy label G divided by building size (also not listed monuments selected as a filter) (Vastgoeddata, 2023)

Different manners of finding buildings can be thought of when zooming out to the level of The Netherlands. To illustrate, firstly, each municipality has its vision of how to deal with the built environment and the housing needs of its citizens, which is reflected in different policies. Certain municipalities have a more progressive vision of transforming buildings than others. However, these positions are often temporary. Secondly, cities can also be chosen based on where developers are currently the most active. Thirdly, one can also choose areas with the highest property value as this would suggest that citizens are willing to pay more in these areas, which would better the business case. For this thesis, all Dutch municipalities have been checked for the number of buildings using the following filters: the office building has a minimum size of 3000m², is not a listed monument and has an energy label worse than C. It can be noted that 696 buildings can be found. The table below displays 15 Dutch municipalities with the highest number of buildings that align with the abovementioned characteristics (compiled on 13 November 2023) (Centraal Bureau voor de Statistiek, 2023a; Vastgoeddata, 2023). In Appendix E, the list of all Dutch municipalities can be found. Similar to what was observed in The Hague, it is noted that when the filter for minimum building size is removed, a lot more buildings with an energy label G can be found in these 15 municipalities- namely 346

buildings. This could be because many buildings with an energy label G have already been transformed or demolished.

Table 31: 15 Dutch municipalities with the highest number of office buildings with a minimum size of 3000m² (and not listed monuments)which have an energy label worse than C. (compiled on 13 November 2023)(Vastgoeddata, 2023)

Amsterdam	Rotterdam	's-Gravenhage	Arnhem	Utrecht	Zoetermeer	Haarlemmermeer	Breda	Eindhoven	Dordrecht	Rijswijk	Delft	's-Hertogenbosch	Amersfoort	Leiden
51	27	26	22	20	18	17	16	15	14	13	12	12	11	10
Total in 15 municipalities						284 buildings								
Only label G and unknown						199 buildings								
Only label G						36 buildings								

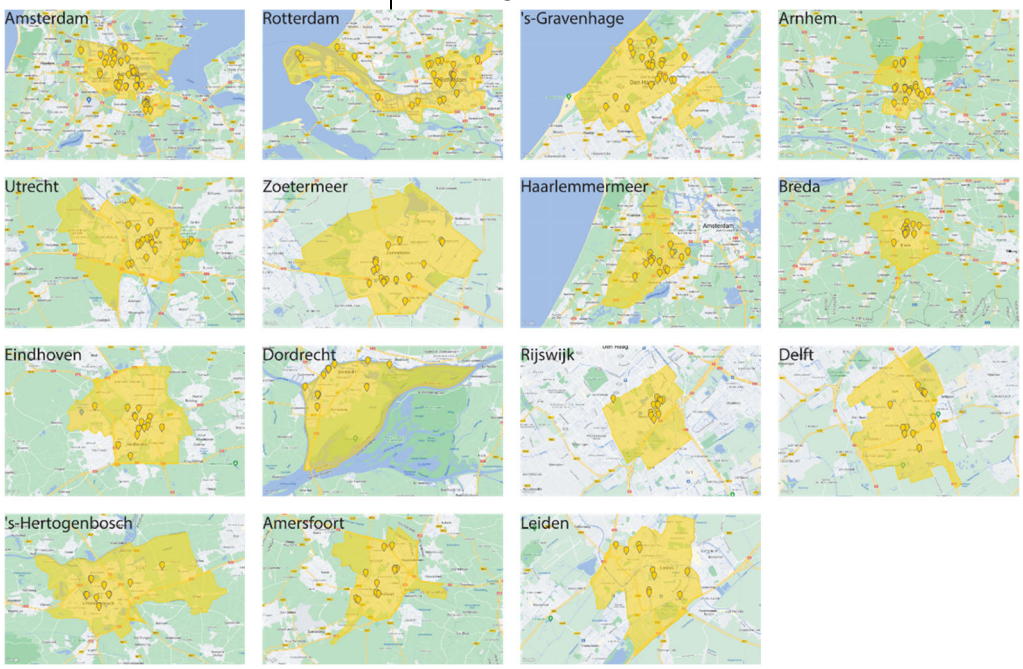


Figure 53: Transformation of an office building in Glashaven (Rotterdam) into studios for students (Van Wijnen, N.D.-c)

1.19 Discussion

The thesis explored the transformation potential of office buildings in The Hague to residential functions to keep up with the housing needs in The Netherlands. The number of dwellings delivered through conversions has decreased in the past few years. Thus, instead of looking at vacant buildings, the perspective is shifted, and buildings that could potentially become economically obsolete are looked at due to the mandate to upgrade the energetic performance of utility buildings. The main question was "To what extent can the number of office-to-housing conversions in the Netherlands be increased to meet the public goal of realising 15.000 dwellings through transformation a year?". Below follows a discussion of the results.

Office buildings were selected with the following features to generate a stock of buildings to assess the transformation potential - the building is in the municipality of The Hague and has the purpose of "office building" assigned to it; the building is not a listed monument as this complicates the process, is at least 3000m², and has an energy label of worse than C. One of the underlying assumptions of the Conversion Meter is that the building being analysed should be vacant or is expected to become vacant. Vacancy was not used as a filter during the analyses. The energy label was used as a proxy for potential vacancy. Due to the government mandate, by 2030, all office buildings must have an energy label A to be in use. Thus, this mandate requires building owners to assess the future rentability of the building before investing in it. Attractive buildings have good rental perspectives and are not affected by this mandate as building owners can factor in the investment costs of upgrading into the rent. However, some buildings within this stock are expected to be sold because of this mandate, as building owners face difficulty financing these investments. On the other hand, some of the filters used were applied to keep the sample size manageable. To illustrate, filtering on building size is not equally relevant from a research perspective alone. However, the choice of the minimum size of the building depends on the demands of the type of investor/developer as the building determines, among other things, the number of units which can be created and sold/rented. Data was collected at a construction concern, thus, because the volume of the construction project is critical to their business, mid to large sized buildings are more interesting. However, partial transformations and the transformation of smaller buildings are more popular (most buildings that have been transformed are between 500m² and 5000m² in size).

The first part of the thesis focused on what makes a building suitable for transformation to residential function. The criteria of the Conversion Meter were reviewed, and it was found that the list of criteria already included was quite extensive. The main feedback received was on the “black and white” judgement of the characteristics of the buildings. Thus, many of the feedback received were not points to be imbedded in the tool, however, added to the background knowledge one must have in order to judge the results of applying the tool correctly.

The second sub-question focused on determining the stock of office buildings to analyse in The Hague. This was done firstly by analysing the settlement climate for business in the city. Twenty-six buildings were selected at the beginning of the analysis, five of which were discounted for numerous reasons, leaving 21 buildings over. These 21 buildings are dispersed between 23 neighbourhoods in The Hague. The checklist of gradual criteria on a building and location level was applied to these buildings, and

the results are discussed below. The areas where the office buildings are found currently are also discussed below, including the CID, the different business parks, and the city centre.

Table 32: Overview of buildings and conversion class after filling in Conversion Meter

Discounted	Conversion class 1	Conversion class 2	Conversion class 3	Conversion class 4	Conversion class 5
5	0	2	10	9	0
Total	26 buildings				

The settlement climate for businesses in The Hague

First, the location of office buildings in a city should be analysed to find office buildings. The most important factors affecting the settlement climate for business in the Hague compared to other Dutch cities are twofold. Firstly, The Hague is the governmental and administrative centre of The Netherlands and is therefore home to the government and administration, the residence of the royal house, most of the ministries and the supreme court. Secondly, The Hague is profiled as the international capital of peace and justice and has a cluster of international organisations and supporting facilities concentrating in what is considered the 'International Zone' (e.g., embassies, consulates, international schools, knowledge institutes). Thus, the largest employer is formed by the public sector, then the cluster of international organisations, followed by business clusters in energy and telecom. The further development of the Central Innovation District (CID) is vital to the city of The Hague as the CID is the second top metropolitan location in the province of South Holland. From the early 2000s, it became popular to develop office buildings near public transport hubs (Van Meijel & Bouma, 2013). In the city of the Hague, there are two large train stations (The Hague Central Station and The Hague HS) and four small train stations (Laan van NOI, Mariahoeve, Moerwijk, Ypenburg). The goal of the CID is to unite the office environments surrounding three stations: The Hague Central Station, Laan van NOI and The Hague Holland Spoor. The municipality of The Hague actively steers the development of the CID through spatial principles to create a different metropolitan area, including a high concentration of workplaces, facilities, housing, high-quality public space, and good accessibility. The development of the CID, which is to create a better spatial connection between three train stations in The Hague, is in line with the office development trend seen from the early 2000s in the Netherlands, in which office buildings are developed around public transportation hubs.

The office environments in The Hague

The city of The Hague has seven differentiated office environments: (1) Inner-city centre location, (2) Creative environment, (3) International interaction environment, (4) Top metropolitan environment, (5) Highway B2B, (6) Urban interaction environment, (7) Outside office concentrations. The buildings that cope with issues in these environments are often small office buildings (up to 500m²) and medium-sized office buildings (501-5000m²). This is the case in the inner-city centre location, international interaction environment, and highway B2B environments. Buildings coping with issues found in the creative environment and urban interaction environment are predominantly medium-sized office buildings (501-5000m²). Most office buildings coping with issues in the outside office concentrations are small office buildings (up to 500m²).

Table 33: Office share of each office environment, under/oversupply expected 2025 in m² and number of buildings found in each office environment

	Inner-city centre location	Creative environment	International interaction environment	Top metropolitan environment	Highway B2B	Urban interaction environment	Outside office concentrations
Office share	27%	5%	6%	27%	5%	8%	23%
Under/oversupply (2025)	-32.300m²	-116.600m²	29.500m²	33.300m²	111.700m²	46.100m²	8.800m²
# buildings	7 Buildings	2 Buildings	3 Buildings	3 Buildings	0 Buildings	4 Buildings	7 Buildings

It was noted that zero buildings were found in the Highway B2B office environment and the whole district in which this office environment is found (Leidschenveen-Ypenburg). This is interesting as the office district in Leidschenveen-Ypenburg is expected to have an oversupply by 2025. Next, few buildings were found in the outside office concentrations compared to the total surface area of The Hague. It was determined that this is due to the size of the building used to filter out buildings out of Vastgoeddata and the development of The Hague through the decades. Leidschenveen-Ypenburg is one of the most recently developed districts of The Hague, which means the buildings in this district are, in comparison, newer. Next, several office buildings with an energy label worse than C need to be upgraded in these areas. However, these buildings are smaller than 3000m². The table below shows the number of buildings in The Hague with an energy label G sorted by building size. Most buildings with the worst energy label are small (<500m²).

Table 34: Buildings in the Hague, not a listed monument, office building, size varied, energy label G

0-500m²	501-1000m²	1001-2000m²	2001-3000m²	3001-4000m²	4001-5000m²	>5001m²	Total
22	9	2	2	0	0	3	38

Next to that, The Hague also has several business parks where buildings have been found. Firstly, the ZKD business park (2 buildings found), The Binckhorst (3 buildings found), and the Frederikkazerne (1 building found). Conflict was observed between the buildings' characteristics and the location's features. Some of the buildings found in the Binckhorst and the Frederikkazerne had- on a building level- characteristics which were suitable for transformation to a residential function. However, to introduce housing in these areas, area development must also take place to improve the facilities' quality and the environment's appearance. The municipality assigns Binckhorst as a transformation area, aiming to revitalise the area by mixing more functions. The Frederikkazerne is not a business park, but a military barrack still used by the Ministry of Defence. Little potential was seen in the buildings found in the ZKD business park, as the buildings themselves were unsuitable for transformation.

After the Second World War, creating office buildings in the historical city centre was popular. Some of these buildings' characteristic appearance has awarded them a monumental status. In 3 of the 26 cases, buildings with protected features were found in the city centre. Another building was found which had a volume which was a municipal monument. However, this building is located outside the city centre.

Perspective of municipality

The municipality is interested in providing sufficient dwellings but also has a stake in not disrupting the balance in the office market. Therefore, the municipality has stated in online documents that they will take a reserved position regarding transformations to slow down the automatic withdrawal of too

many office buildings in the city. However, when it comes to the housing goals, they envision and promote the provision of student dwellings through transformation, especially around educational facilities throughout the city (e.g., Laakkwartier and Spoorwijk, city centre). Next to that, 1 of the 26 buildings was also discounted because the municipality envisions it being transformed into an international knowledge centre for sustainability to stimulate the further development of the neighbourhood.

Perspective of Central Government Real Estate Agency

In line with the profile of The Hague as the governmental and administrative centre of The Netherlands and the international capital of peace and justice, many of the buildings found were either owned by the Central Government Real Estate Agency (Rijksvastgoedbedrijf in Dutch) or in use governmental agencies (e.g., embassy)-in total 7 of the 26 buildings. A part of the real estate strategy of the Central Government Real Estate Agency is to divest all real estate which is no longer being used for state purposes. As the state owns these buildings, the Central Government Real Estate Agency is responsible for repurposing the building/ground to serve a social purpose in line with the neighbourhood's needs. The divestment strategy of the Central Government Real Estate Agency consists of four categories, and most buildings divested end up in the complex transformation category:

- Sell but keep current function (0-5%),
- Transformation (10-15%),
- Complex transformation (70-80%),
- Area redevelopment (1-2%).

The perspective of target groups for The Hague

The primary target groups which the municipality wants to provide dwellings for in the coming years are young urban professionals, urban families, empty nesters, expats, and students, as these target groups contribute to the international, friendly, lively, and economic profile of the Hague. Settlement is encouraged in the Binckhorst, the CID, the coastal zone, and the urban fringe.

Table 35: Overview of target groups the municipality wants to focus on

Young urban professionals	Urban families	Empty nesters	Expats	Students
Small, affordable, and mid-priced dwellings	Flexible family apartments and houses. Self-build locations in quiet urban areas.	Attractive apartments in the mid and high segment	Furnished homes, full-service concept dwellings	Student dwellings *Through transformation
Rent and owner-occupied	Rent and owner-occupied	Rent and owner-occupied	-	-
CID, Binckhorst, neighbourhoods in and around the city centre	Zuid-West, Mariahoeve, districts around the city centre	Coastal zone	CID, Internationale zone	CID, next to education facilities

Perspective building owners

The mandate to upgrade the energy performance of office buildings requires building owners to assess the future rentability of the building to determine whether to invest or divest. Attractive buildings have good rental perspectives and are not affected by this mandate as building owners can factor in the investment costs of upgrading into the rent. However, some buildings within this stock are

expected to be sold because of this mandate, as building owners face difficulty financing these investments.

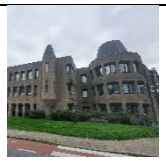
Building perspective	Location perspective
The works which need to be done to upgrade the energy performance of this stock of office buildings can be done on the service layer of the building (e.g., LED lighting) or, more invasively, on the skin layer of the building (e.g., insulation). Energy label C can easily be reached by upgrading the installations- remaining on the service layer. However, in the case of buildings with an energy label G, upgrading the skin of the building (e.g., thermal insulation, roof insulation, HR++ glazing) is also needed, which requires a more significant investment. These buildings are typically owned by private investors, speculative investors, private funds, and limited partnerships, and the owners tend to have a limited cash flow. For these owners, acquiring financing might prove difficult.	This is especially true for office buildings in unattractive locations characterised by low rentability and low rents. Thus, a proportion of this stock will become economically obsolete due to the investment costs needed. Although office buildings on the qualitative lower end of the office stock can be found across all office locations, most vacant office buildings are found in formal office locations (monofunctional office locations or office concentrations on business parks). Therefore, it can be reasoned that many office buildings made obsolete due to the label requirement will also be concentrated in these locations.

It was calculated in previous research that for The Hague, there is quantitatively sufficient office stock; however, qualitatively, a mismatch can be seen between supply and demand (inability to find an office in the desired office environment). An estimate was made for 2025, also accounting for current (re-) development plans, which showed that an oversupply is expected in the Highway b2b locations. Of the 26 buildings found, zero were in this area due to the filters used (predominantly, the requirement that the minimum size must be 3000m²). Alternatively, an undersupply is expected in 2025 in the Binckhorst area. In this area, 3 of the 26 buildings were found.

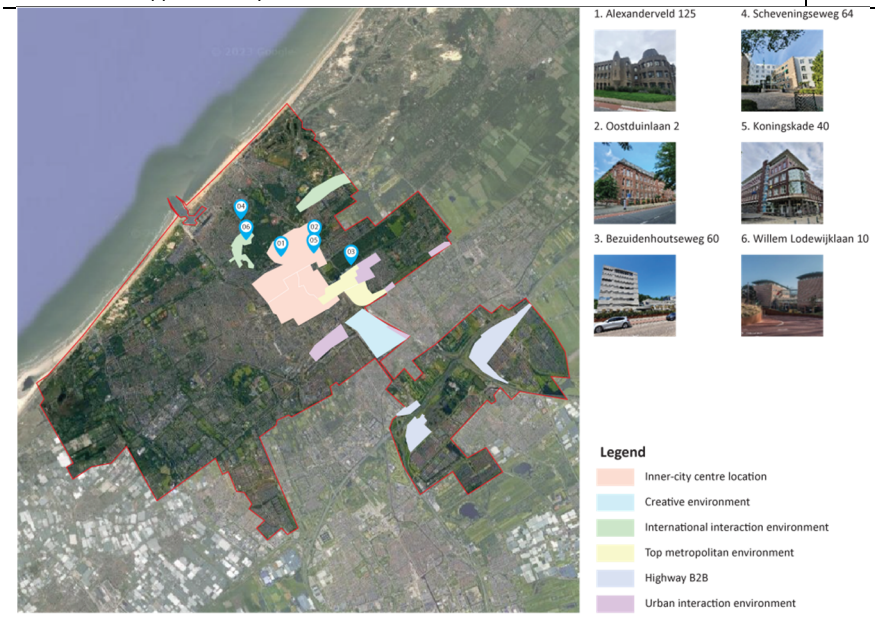
The transformation potential of this building stock

The paragraph below will focus on the most notable observations from analysing these buildings. Some elements will not be repeated in this paragraph because they were discussed above. As a result of filling in the tables of the Conversion Meter and discussing the buildings with an expert panel, six buildings were selected, which scored positively, which means that the buildings scored a conversion class 4 or 5 and were selected as most likely to be transformed by the developers interviewed.

Table 36: 6 buildings resulting from the last step analysis

					
Willem Lodewijklaan 10	Koningskade 40	Scheveningseweg 64	Bezuidenhoutseweg 60	Oostduinlaan 2	Alexanderveld 125
2003	1994	1989	1972	1920	1958
Zorgvliet	Haagse bos	Statenkwartier	Haagse bos	Benoordenhout	Archipelbuurt

3.640m²	3.741m²	5.381m²	7.965m²	9.874m²	48.317m²
Total amount of square meters				75.177 m²	
Total amount of square meters minus 25% circulation space				56.382,75 m²	
The total amount of square meters minus 25% circulation space divided by 30m² units would deliver approximately				1.879 units	



Urban location

These buildings can be found in 5 neighbourhoods (Zorgvliet, Haagse Bos, Statenkwartier, Benoordenhout and Archipelbuurt) northeast of The Hague. Notably, the neighbourhood profiles of dwellings found in these areas are similar. Most of the residents in these neighbourhoods are between the ages of 20 and 64. Most of these residents live in apartments, and most dwellings in these neighbourhoods are in the owner-occupied segment. A difference can be noted in the level of household composition. As displayed in the table below, most households in Haagse Bos, Benoordenhout and Archipelbuurt are single-person households, whilst most households in Zorgvliet and Statenkwartier consist of couples cohabiting without children.

Predominant	**Age group**			**Dwelling type**		**Ownership**			**Household composition**			
	<19	20-64	65>	Single-person dwelling	Appartements	Owner-occupied	Social rent	Private rent	Single-person households	Cohabitating without children	Cohabitating with children	Single-parent households
Zorgvliet		47,3%			85,2%	71,2%				42,1%		
Statenkwartier		58,7%			68,4%	59,0%				68,4%		
Haagse Bos		51,7%			98,6%	71,1%			56,8%			
Benoordenhout		50,1%			69,6%	72,9%			43,5%			
Archipelbuurt		58,8%			72,0%	56,5%			54,2%			

Ownership

Public, private, and international organisations own these buildings. One of the buildings is an embassy owned by the Republic of China (Willem Lodewijklaan 10). Two buildings are owned by the Central Government Real Estate Agency (Bezuidenhoutseweg 60 and Alexanderveld 125). The owner

is unknown (Koningskade 40, Scheveningseweg 64). Bekke & Partners Real Estate owns Oostduinlaan 2.

Degree of facilities in the direct vicinity of buildings

The provision of different facilities in the direct vicinity of the buildings was looked at, such as car parking facilities, public transport connections, shops, hospitality/meet-up places, basic medical facilities, cultural facilities, sports facilities, and educational facilities. Of the six buildings, all scored positively when providing necessary facilities in the neighbourhood, except for one building (Alexanderveld 125). These buildings were assessed using a bandwidth of acceptable walking distances to different facilities. However, the building along the Alexanderveld 125 scored poorly because it fell outside the boundary of these bandwidths by a few 100 meters. Thus, in a practical sense, this building is also near sufficient facilities. Most buildings are close to a bus or tram stop – the shortest walking distance is 130 meters to a bus stop (Bezuidenhoutseweg 60), and the longest is 850 meters (Alexanderveld 125). Next to that, all the buildings are within a 5 km radius of a main train station stop – with the shortest distance being 800 meters to The Hague Central Station (Bezuidenhoutseweg 60) and the longest distance being 3900 meters to The Hague Central Station (Scheveningseweg 64). Next to that also, all the buildings are in very green environments or near large parks. To illustrate, Scheveningseweg 64 is located next to Van Stolkpark en Scheveningse Bosjes, Koningskade 40 and Bezuidenhoutseweg 60 are located next to the Haagse Bos, Alexanderveld 125 and Willem Lodewijklaan 10 are located next to Zorgvliet, Oostduinlaan 2 is located across Oostduinpark. All the buildings seem to have parking spaces arranged on the property. However, it is unknown how many parking spaces are available for some. Bezuidenhoutseweg 60 has 56, Oostduinlaan 2 has 41 and Alexanderveld 125 has 390. Lastly, variations were found when looking at the proximity of facilities such as hospitality, schools, and the proximity of sporting venues.

Appearance of the building

Several buildings also scored positively due to their distinctive appearance (e.g., Oostduinlaan 2, Alexanderveld 125 and Koningskade 40). Next, the fact that the appearance of the building along Scheveningseweg 64 is in line with the wishes of the elderly (e.g., quiet, green environment, privacy) also positively impacted its score. These buildings also have many windows, a straightforward grid, and a clear internal circulation structure.

Built year

Buildings can be found in various decades, with the youngest building being built in 2003 (20 years old). What was observed is that due to changes in the building periods, different benefits and constraints were seen. For example, the building along the Oostduinlaan 2 has spatial high rooms and tall windows; however, extending the building is impossible due to the roof construction. At the same time, the building along Bezuidenhoutseweg 60, for example, was built when buildings were over-dimensioned, making extending the building with a lighter construction easier.

Specifically for the building along the Alexanderveld 125 – which is 48.317m²- the feasibility depends on whether a client is interested in taking on a building of this size. The size of the building brings inherent risks with it, and this makes such a transformation complex. These six buildings in The Hague amount to 75.177 m² in total. This large amount is mainly due to the large size of the building along the Alexanderveld 125 (48.317m²-64%). This would result in approximately 1.879 units of 30m²

(discounting 25% circulation space) should these buildings be transformed. It is important to note that the number of square meters would have been significantly lower if Alexanderveld 125 had not made it through the filter.

Approximately 43% of the stock of buildings analysed in The Hague was deemed to have transformation potential based on the results of the Conversion Meter (9 out of 21 buildings) and approximately 29% was deemed to have transformation potential based on the results of the Conversion Meter and the discussions with the expert panel (6 out of 21 buildings). Transformation is only possible if there is sufficient accretion of buildings that become obsolete and have features that are in line with the demand for housing. When looking across all Dutch municipalities, it can be noted that more than 600 buildings are in line with the previous filters. Looking at only buildings with an energy label G and buildings where the label is unknown, it can be noted that there are 527 office buildings in the Netherlands. However, looking only at buildings with an energy label, G delivers 77 office buildings in the Netherlands- significantly less. Most buildings with an energy label G are small office buildings. Thus, looking at this group of buildings in the future could be worthwhile. Furthermore, the mandate to upgrade the energy performance of a building counts for all utility buildings (e.g., schools, commercial spaces, hospitals). Thus, more types of real estate can be looked at. Also, plenty of buildings smaller than 3000m² could be looked at as well.

1.20 Conclusion

This thesis explored the following research question: To what extent can the number of office-to-housing conversions in the Netherlands be increased to meet the public goal of realising 15.000 dwellings through transformation a year? The motivation for this exploratory research is founded in the aim to tackle the housing crisis in The Netherlands by producing 100.000 dwellings in total per year up to and including 2030, of which 15.000 dwellings per year should be produced through the transformation of commercial real estate. The city of the Hague was chosen as a case study.

The first part of the thesis was focused on answering the following sub-question: What makes a building suitable for transformation to residential function? To answer this question discussions were held with an expert panel to check the validity and the applicability of the Conversion Meter, the tool that was used to analyse the buildings. The Conversion Meter presents several veto and gradual criteria which can have a positive or negative impact on the transformability of the building. The strength of the Conversion Meter lies in the ability to quickly compare several buildings using the criteria which results in a ranking. Some of these criteria have been altered because of feedback received from an expert panel. To produce criteria for a tool, the complexity of the transformation process had to be reduced to a normative approach. As the Conversion Meter has a binary judgement system, the most critical feedback received relates to the formulation of some of these criteria. This was especially the case in terms of the technical requirements on a building level (e.g., minimum building size, maximum building depth, maximum ceiling height). Thus, understanding the origin and motivation behind each criteria one can then edit based on the needs of that actor (e.g., minimum building size is a marketability criteria and different depending on the client/developer). Answering the question, what makes a buidling suitable for transformation also required providing some more nuance to the different criteria such as the ability to bypass some municipal requirements, such as the responsibility of developers to provide sufficient parking. The parking norm can be reduced through other solutions such as the provision of shared mobility or by choosing a target group which have a lower parking norm (e.g., students). This is important given that the majority of transformation projects deliver dwellings for students and starters. Next, the ability to densify the plot of building through extending the building vertically or horizontally is considered a way to improve the (financial) feasibility of the project. However, it can be noted that most transformations executed are partial transformations (75% or more of the property's surface area was transformed to residential space in only a third of buildings transformed and in 52% of buildings transformed less than 50% of the property's surface area was transformed to living space). The Conversion Meter provides a snapshot of the transformation potential of the building and this snapshot is currently unable to account for area redevelopment. This complicates the comparison of certain buildings. City centres are dense and lack space for new development. As cities expand, they engulf areas which were previously seen as unattractive (e.g., industrial areas), stimulating public parties to densify and mix different functions in these areas (e.g., Binckhorst).

When it comes to the application of the tool, it was determined that a tool such as the Conversion Meter is valuable for improving the knowledge position of public parties which have a role to play in maintaining a well-balanced housing and commercial real estate market. This is because from the point that the developer, architect, or contractor is involved, the initial potential of transforming the building has already been assessed by, for example, the initiator or building owner. Furthermore,

developers, architects, and contractors have sufficient insight accumulated through past experiences to quickly assess the opportunities a building presents. This way public parties, who have less in-depth/ intuitive knowledge of buildings, can steer the transformation of buildings on a city level more effectively.

The second part of the document focused on answering the question: where are office buildings situated? A few filters were applied to keep the number of buildings to be analysed manageable due to time constraints. Buildings in The Hague were filtered based on their surface area, function, monumental status, and energy label. The application of these filters resulted in the selection of 26 buildings. The city of The Hague has seven differentiated office environments where these buildings can be found. In the Inner-city Centre Location, seven buildings were found, three buildings were found in the Creative Environment, three buildings were also found in the International Interaction Environment, two buildings were found in the Top Metropolitan Environment, null were found in the Highway B2B, three buildings were found in the Urban Interaction Environment, and eight buildings were found in the Outside Office Concentrations.

The most notable observation made is that of these office environments, an undersupply of qualitative office spaces which match the demand is expected in 2025 in the Inner-city centre location and Creative environment, whilst an oversupply is expected in the rest of the office environments, especially in the Highway B2B and Urban interaction environment. The buildings that cope with issues in these environments are often small office buildings (up to 500m²) and medium-sized office buildings (501-5000m²). The Highway B2B office environment is in the Leidschenveen-Ypenburg district, one of The Hague's newer parts. Null buildings were found in this whole district due to the minimum size of buildings that were used during the filtering. There are office buildings in this district with an energy label worse than C now. However, they are all smaller than 3000m².

The third part of the thesis was focused on answering the following sub-question: ”What is the transformation potential of this building stock, and what are the risks and opportunities present within this building stock when it comes to using transformation as a strategy to prolong their lifespan?“. The 26 buildings found were first analysed using the Conversion Meter. Five of the 26 buildings initially found were discounted due to (existing) plans and/or municipal vision to demolish, renovate or transform the buildings-leaving 21 buildings over. Zero buildings were awarded conversion class 1 (no transformation potential), two buildings were awarded conversion class 2 (hardly any transformation potential), ten buildings were awarded conversion class 3 (limited transformation potential), nine buildings were awarded conversion class 4 (high transformation potential), and zero buildings were awarded conversion class 5 (excellent transformation potential). Thus approximately 43% of the stock of buildings analysed was deemed to have transformation potential (9 out of 21 buildings).

Of the buildings awarded with no, hardly any or limited transformation potential, the assessment of the potential of 3 of the buildings in the city centre was considered difficult. It would require more detailed research (e.g., unclear how access is arranged, and which part of the building is connected to other buildings). Next to that, three other buildings were deemed unsuitable because of spatial dimensions which did not align with the spatial dimensions for buildings with a residential function (e.g., large open spaces). Six buildings were discounted because they were situated in office parks or industrial parks where area redevelopment would be needed. Of these six buildings, two were for

warehousing and distribution centres and scored low on gradual criteria at the building level. One building was located on the property of an active military barrack, which means the whole military barrack would have to be discontinued for the building to become interesting. Three buildings were in an industrial area, which has been labelled as a transformation area- the Binckhorst. The most notable observation is that it was difficult to accurately compare the suitability of the Binckhorst buildings with those located elsewhere. One of the underlying ideas in the Conversion Meter is that buildings near highway locations or in office parks are less suitable for transformation to residential functions (e.g., lack of supporting facilities). Industrial parks and office districts were often built near highways and/or on the city's outskirts. However, as cities grow and expand, they engulf areas previously on the outskirts, and Binckhorst is an example of such an area. This shift is also reflected in the municipal vision to transform the Binckhorst into a mixed-use area as it is situated centrally relative to the total size of The Hague. Thus, although buildings in this area were not deemed to have a high transformation potential based on the approach applied, they remain interesting because, on a building level, they have many features that can be retrofitted for a different function. The Binckhorst is thus attractive for more pioneering investors/developers.

Following the analysis using the Conversion Meter, the transformability of buildings was discussed with an expert panel with the aim of calibrating the results of the analysis. The expert panel selected nine buildings as most likely to be transformed compared to the rest. Six buildings overlap between the nine buildings awarded with a high transformation potential and the nine buildings determined most likely to be transformed by the expert panel. These six buildings are in three office environments: the Inner-City Centre Location, the International Interaction Environment, and the Outside Office Concentrations. These buildings are found in mixed neighbourhoods with many facilities, good public transport facilities and predominantly owner-occupied dwellings. What also stands out is that some buildings have a characteristic appearance and are in green environments.

Some limitations were observed in the filters used for the selection of the buildings. Firstly, the size of the building is essential concerning the number of units which can be rented out or sold off after the transformation is finished. Thus, the size of the building- or the number of units realised- says something about the project's financial viability. Most transformation projects are between 500 and 5000 m² and most buildings transformed. More importantly also, most transformation projects are partial transformations. However, in the stock of buildings filtered out, 18 of the 26 buildings were larger than 5000m², 11 of the 26 were larger than 10.000m² and 4 of the 26 were larger than 20.000m². Next, 1 of the six buildings with a high transformation potential is larger than 20.000m². One of the issues with buildings this large is finding an investor willing to take the risks associated with the project size, as the consequences of misalignment in supply and demand at the end of the development period are compounded by the large project size. Furthermore, the city of The Hague is densely populated and expected to keep growing. The overall demand for space for all types of functions is high. At the same time, there are space constraints, especially in the city centre, as the spatial opportunities for development are limited. Therefore, the transformation of buildings is relevant for realising dwellings as well as other functions. Housing can/will only be realised if the value of realising housing is higher than other functions in the exact location.

Next, each office environment has its own identity. To successfully introduce new residents, the residents would need to add value to the existing identity of the neighbourhood. To illustrate, 1 of the

six buildings which scored suitable for conversion is in the international zone, which has a cluster of international organisations (as well as supporting facilities for these international organisations, such as international schools). This area's dwellings are mostly owner-occupied or apartments in the private rental segment. Transformation projects are often executed for target groups such as students or starters. An underexposed element is the consequence of reluctant neighbours who object to the new plans. Users objecting to the project could lead to delay; early participation and communication with the neighbourhood help with this. The transformation of the DC van Hallen is an example of a project that was delayed due to residents filing a lawsuit against the transformation of the office building due to the threat of (noise) nuisance, which resulted in the dwellings having smaller windows and no balconies.

Lastly, buildings were looked at which had an energy label worse than C. The works which need to be done to upgrade the energy performance of this stock of office buildings can be done on the service layer of the building (e.g., LED lighting) or, more invasively, on the skin layer of the building (e.g., insulation). Energy label C can easily be reached by upgrading the installations- remaining on the service layer. However, in the case of buildings with an energy label G, upgrading the skin of the building (e.g., thermal insulation, roof insulation, HR++ glazing) is also needed, which requires a more significant investment. The mandate to upgrade the energy performance of office buildings to an energy label A mainly affects buildings with an energy label G, which do not have good rental perspectives as these building owners cannot factor in the investment costs of upgrading into the rent. These buildings are typically owned by private investors, speculative investors, private funds, and limited partnerships, and the owners tend to have a limited cash flow. For these owners, acquiring financing might prove difficult. The odds of a building with an energy label G being divested and sold by the owner are more significant than buildings with an energy label D, E, or F if this building has bad rental prospects. Zooming out once more, when looking at office buildings in The Hague with an energy label G, it can be noted that there are currently 38 buildings. However, most of these buildings are small, which is why they were filtered out. 22 out of the 38 buildings are smaller than 500m², whilst 9 out of the 38 buildings have a size between 501m² and 1000m². Next, only two are between 1001m²-2000m² and two buildings are between 2001m²-3000m². The remaining three buildings are larger than 5001m². Notably, this stock of buildings is significantly older, with the oldest constructed in 1820 and the youngest in 1984. Most of these buildings are in the city's older districts (e.g., Centrum, Segbroek, Scheveningen, Haagse Hout). This explains why in the group of 26 buildings, only three were found with a label G. Of the six buildings with a high transformation potential, only one has an energy label G (Alexanderveld 125), and the energy label of 2 other buildings is unknown (Oostduinlaan 2, from 1920 and Koningskade 40, from 1994). The Central Government Real Estate Agency owns the building along the Alexanderveld 125 (police headquarters) but will be divested eventually, as the police headquarters has moved to the Binckhorst.

The last part of the thesis was focused on answering the following sub-question: ”How would transforming this building stock affect the number of dwellings delivered through conversions each year?“. The municipality of The Hague aims to add 4.000 dwellings annually to keep up with the population growth (30% social rent and 20% mid-segment rent). This supply will be mainly delivered through the densification of the city centre, the transformation of existing real estate and business parks, and the building of new buildings in vulnerable neighbourhoods. The primary target groups the

municipality wants to provide dwellings for in the coming years are young urban professionals, urban families, empty nesters, expats, and students. These target groups were chosen as they contribute to the international, friendly, lively, and economic profile of the Hague. Settlement is encouraged in the Binckhorst, the CID, the coastal zone, and the urban fringe. The municipality has not stated the number of dwellings that should be delivered through transformation; however, assuming the national benchmark of 15% would mean a minimum of 600 dwellings a year through transformation (15% of 4000). The six buildings with a high transformation potential amounted to approximately 56.382 m². This amount is mainly due to the large size of one building (Alexanderveld 125), which has a surface area of 48.317m². The five other buildings are all smaller than 10.000m². Theoretically, this would amount to 1.879 units (after discounting 25% of the square meters for circulation and assuming 30m² units). Whether these buildings will become obsolete remains to be seen; however, transformation could be considered if they do. Especially the building along the Alexanderveld 125 since the police headquarters is moving to Binckhorst.

To conclude, to be able to transform office buildings into dwellings, there needs to be an accretion of office buildings that are both obsolete and, therefore, divested by the owners and are suitable for the residential function. The transformability to residential function of 26 office buildings in The Hague was analysed to determine to what extent the number of office-to-housing conversions in the Netherlands can be increased to meet the public goal of realising 15.000 dwellings through transformation a year. It was determined that 43% of the buildings looked at have the potential to be transformed according to the Conversion Meter and after calibrating the results with an expert panel it was determined that approximately 29% of the buildings have the potential to be transformed. For The Hague it was determined that, given the goal to realize 4000 (new-built) dwellings a year, 600 (15%) would have to be realised through transformation a year. Thus, the buildings analysed and deemed to have the potential to be transformed in this thesis, would add significantly to this goal, however, would not be sufficient. As mentioned above, the filters applied were strict and therefore, many buildings were discounted. Zooming out further, the cities with the most amount of office buildings larger than 3000m² with an energy label worse than C, currently are in descending order, Amsterdam, Rotterdam, 's-Gravenhage, Arnhem, Utrecht, Zoetermeer, Haarlemmermeer, Breda, Eindhoven, Dordrecht, Rijswijk, Delft, 's-Hertogenbosch, Amersfoort, and Leiden. In these municipalities, 284 buildings can be found, of which 199 buildings have an energy label G or unknown and 36 buildings have an energy label G. Like The Hague, a significantly smaller percentage of buildings with an energy label G larger than 3000m² can be found. This could be because these buildings have already been demolished or transformed. Like The Hague, removing the filter for minimum building size shows a different image, namely that there are 346 buildings in these 15 municipalities which could be looked at.

1.21 Reflection

This segment presents the reflection of the thesis process with a focus on the research design and the results. The most notable observations about the chosen method will be reviewed to determine how well the approach worked and why.

Reflection on the selection method and using a database

A few issues were noted when using filters in a database (Vastgoeddata.nl) to generate a stock of buildings to run through the Conversion Meter. This database combines data from different sources and presents it as a factsheet per building. However, it was found that some of the information displayed must be taken with reservation and double-checked. Some inconsistencies were noted and are described below.

Sometimes listed monument

Listed monuments were initially filtered out. The database retrieves information regarding listed monuments from the National Monument Registry (Rijksmonumentenregister in Dutch), which the Cultural Heritage Agency of the Netherlands manages. However, after researching some of the buildings online, it was noted that a few buildings (2 buildings) located in the city centre were listed as monuments, and one other building was found to be a municipal monument partly.

Unclear if a building is merged with others

Buildings in the database are identified through their registered address according to the Bag (Basisregistratie Adressen en Gebouwen). Office buildings in the city centres are in high demand due to the large degree of facilities surrounding them and how accessible they are. These buildings are also very old. As the possibility of expanding in city centres is limited, office buildings have been merged into larger complexes over time. However, a building part of a larger complex may be selected only using Bag data. Assessing the building on its own is, therefore, useless. However, it might not be clear which buildings belong in the ensemble using this approach.

Delay in the information update process

Because of the length of real estate development processes, there were some buildings which were selected initially which were discounted from the stock due to renovation plans (2 buildings), demolition plans (1 building), municipal vision for new function (1 building) or transformation plans (1 building). This information was either found in online documents or was known because I visited the building (e.g., demolition). Thus, with this stock of buildings, a percentage is already undergoing work, even though this is not visible yet in databases due to the long development process and a delay in updating information. In the case of The Hague, 5 out of the 26 buildings were discounted.

Reflection on selection criteria

In hindsight, it would have been more interesting to only select buildings with an energy label worse than C or unknown instead of looking at all buildings with an energy label G and unknown. This is because, for these buildings, the probability is that alterations would have to be made in the building's façade and/or roof, which requires more significant investments. This would increase the odds that the building owner would be willing to reevaluate the marketability of the building and choose to sell if this is not in their financial favour.

Reflection on filling in tables gradual criteria on location and building level

The analysis on this scale requires much deduction as certain information is unknown (e.g., floor plans unknown, degree of floor insulation unknown). Thus, discussing the buildings with the developers of the graduation company was also important to understand what information they are using to deduce the "health" of the building.

Reflection on the transition of the Building Code 2012 to "Besluit Bouwwerken Leefomgeving"

For the revision of the Conversion Meter, the Building Code 2012 was checked to update the tool. This was done since, at the moment of writing, the Building Code 2012 was the active document displaying the regulations for existing constructions. However, it should be noted that by the first of January 2024, the Building Code will be replaced by the Besluit Bouwwerken Leefomgeving (BBL) as a part of the introduction of the "Omgevingswet"- which has been called into effect to simplify and merge the regulations for spatial development (figure below). Within this new system, the BKL (Besluit Kwaliteit Leefomgeving) is only relevant for the states, provinces, water boards and municipalities, and the BAL (Besluit Activiteiten Leefomgeving) includes rules for citizens as well as businesses regarding activities in the built environment (e.g., rules about environmentally harmful activities).

Figure 54: An overview of the Relationship between Omgevingsbesluit and the BBL, which replaces the Building Code 2012 (Nieman, n.d.)

The BBL contains rules for citizens and businesses about the construction, usage, and demolition of buildings. Many of the Building Code 2012 rules and regulations were adopted into the BBL. The most significant change between the Building Code 2012 and the BBL is how the regulations are presented to users. The Building Code 2012 is categorised by subject (e.g., fire safety), whilst the requirements for new construction, existing construction and renovations are displayed in different paragraphs. In the BBL, the construction phases (e.g., existing construction, new construction, change of function) are used to group and display the regulations in chapters to simplify the information retrieval process. Next, regulations have been added from other decrees, especially concerning energy performance and waste management (Nieman, n.d.).

Reflection on sensitivity scores Conversion Meter

Some criteria are more important for some groups than others (e.g., if comparing buildings for transformation to student dwellings, for example, proximity of educational facilities, hospitality and public transport hubs are more critical). Because a target group was not previously selected and the analysis was conducted on a city level, the proximity to many facilities was checked. However, the higher the score, the more criteria are added (and consequently multiplied by the default weight). The same goes for if criteria are removed. The score that a building receives on its own should be taken with reservation; thus, how the building scores relative to other buildings is more interesting.

Reflection on the generalisation of results

The Hague was used as a case study for this exploratory research. The development of office buildings in Dutch cities through the years on a spatial level is relatively similar. Office buildings were built in the historical centre (50s). Post-war office buildings were built on the outskirts of the city, then built along the access roads (70s and 80s), consequently built in monofunctional office districts (90s) and then built near public transport hubs (2000s). However, the differences between buildings on an individual level are significant and require that each building be individually assessed. Thus, scaling up the results to explore the number of dwellings that could be delivered through transformation does not give much information regarding the transformation potential of buildings in other Dutch cities. The results for the city of The Hague cannot be generalised as each city is unique and, if compared, should be compared with reservation.

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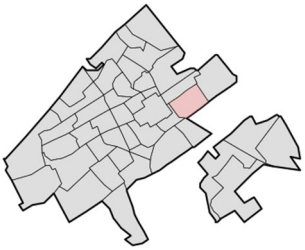
Appendix A

Step 2a: Feasibility scan using gradual criteria at a location level

Bezuidenhout (Bezuidenhout-West)

The building along the Prins Clauslaan 20 is in Bezuidenhout. Bezuidenhout-West is relatively isolated from the rest of the city because the area is surrounded by busy roads and train tracks and due to there being only two access routes. The neighbourhood is characterized by staircase-access flat buildings from the 30s and social housing from the 70s. More than half of this area's dwellings are in the social housing stock, and most are in the rental segment. Next to that, the area is significant for The Hague as the area around the central station, Beatrixkwartier, and the Koekamp attracts many visitors and commuters (Municipality of The Hague, 2015g).



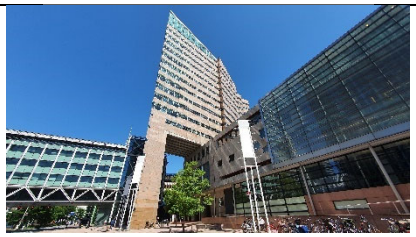


Figure 55: Location of Bezuidenhout in The Hague followed by an image of the building along the Prins Clauslaan 20 (Centraal Bureau voor de Statistiek & Topografische Dienst Kadaster, 2008c; Vastgoeddata, 2023)

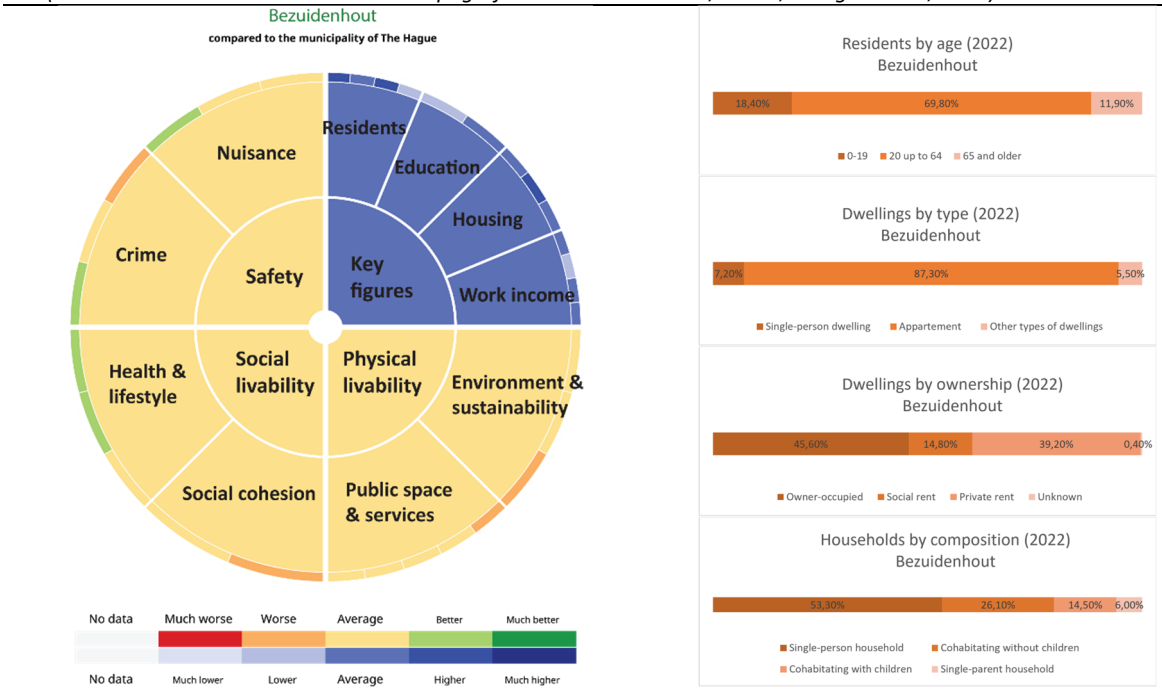


Figure 56: The figure on the left shows the liveability circle for Bezuidenhout, showing how the neighbourhood compares to other neighbourhoods in the Hague. The figure on the right shows different statistics for the neighbourhood (Municipality of The Hague, N.D.-a, N.D.-b)

Prins Clauslaan 20 in Bezuidenhout

Below is a text describing the direct environment in which the building is located. The building along Prins Clauslaan 20 is easily accessible by public transport due to its location incredibly close to The Hague central station (500m), which also provides access to other modes of transportation such as

buses, trams, and the metro. Next to that, the area in which the building finds itself is centrally located and provides access to many facilities such as bars and restaurants, parks (Haagse Bos), and shops for daily necessities (e.g., supermarket, pharmacy). The building is also close to the University of Leiden at Wijnhaven.

Archipelbuurt (Archipelbuurt)

The building along the Alexanderveld 125 is in Archipelbuurt. The Archipelbuurt holds a monumental appearance, and the cityscape is protected. The neighbourhood is densely built with a mix of big buildings from the 19th century, courtyards, and new buildings from the 70s, 80s and 90s. The dwellings in this area are of high quality, and the proportion of social housing is low. The population of this area consists mainly of elderly and expats. Approximately half of the dwellings are owner-occupied. The area has many stores, hospitality functions, and facilities. Furthermore, the area is centrally located and serviced by city centre facilities and Scheveningen. There is much greenery (Municipality of The Hague, 2015a).

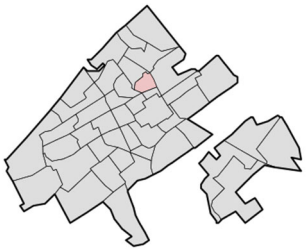


Figure 57: Location of Archipelbuurt in The Hague followed by an image of the building along the Alexanderveld 125 (Centraal Bureau voor de Statistiek & Topografische Dienst Kadaster, 2008a; Vastgoeddata, 2023)

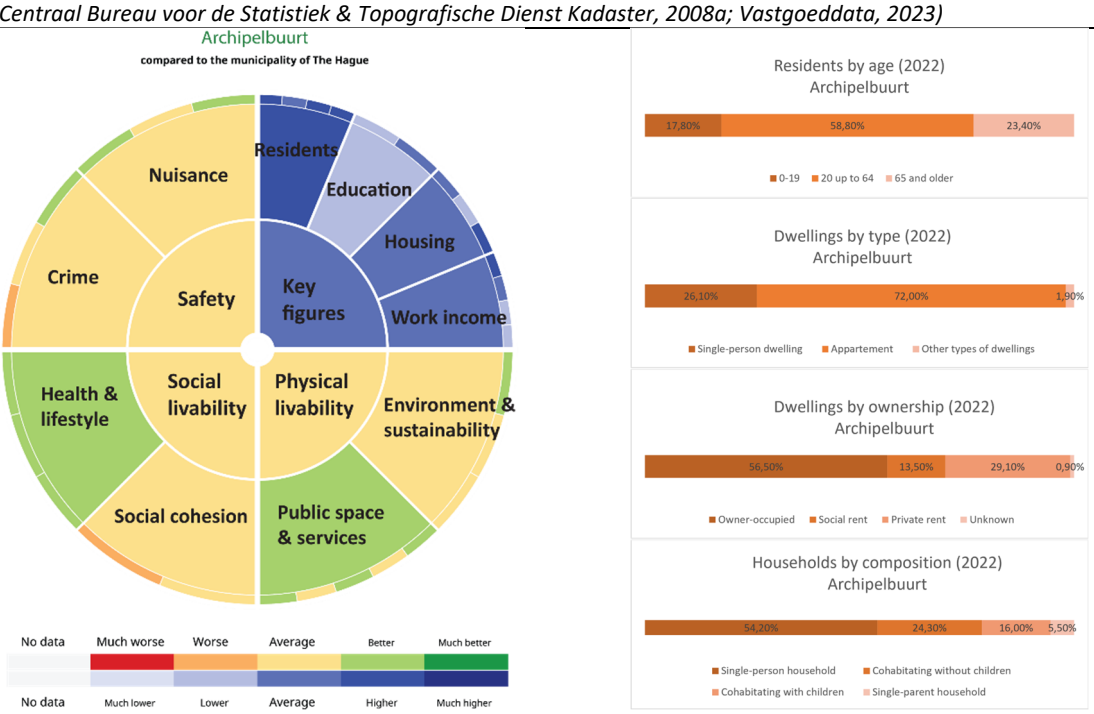


Figure 58: The figure on the left shows the liveability circle for Archipelbuurt, showing how the neighbourhood compares to other neighbourhoods in the Hague. The figure on the right shows different statistics for the neighbourhood (Municipality of The Hague, N.D.-a, N.D.-b)

Alexanderveld 125 in Archipelbuurt

Below is a text describing the direct environment in which the building is located. The building along Alexanderveld 125 is less than 3km from The Hague Central Station. There are parking lots and a bus and tram stop in the vicinity; however, these are approximately 850 meters away. There are basic medical facilities in the vicinity of this building. However, the supply of sports venues close by is limited.

Binckhorst (Binckhorst)

Three buildings are in the Binckhorst area: the building along the Binckhorstlaan 117, the Saturnusstraat 9 and Zonweg 33. The Binckhorst is an area on the eastern side of The Hague that is being transformed into a mixed urban area, including office buildings for companies and dwellings. The area was initially built for industrial companies to settle, after which office buildings were built. There are also several monumental buildings in the area between these office buildings. Dwellings will be built, especially in the Trekvliet area. The northern part bordering the train tracks, De Spoorboogzone, will remain for companies as this area is unsuitable for housing. Currently, the area lacks many facilities (e.g., no elementary schools or facilities for the youth, supermarkets, or outdoor sporting facilities) (Municipality of The Hague, 2015i).

Figure 59: Location of Binckhhorst in The Hague followed respectively by an image of the building along the Binckhorstlaan 117, the Saturnusstraat 9 and Zonweg 33 (Centraal Bureau voor de Statistiek & Topografische Dienst Kadaster, 2008d) (Vastgoeddata, 2023)

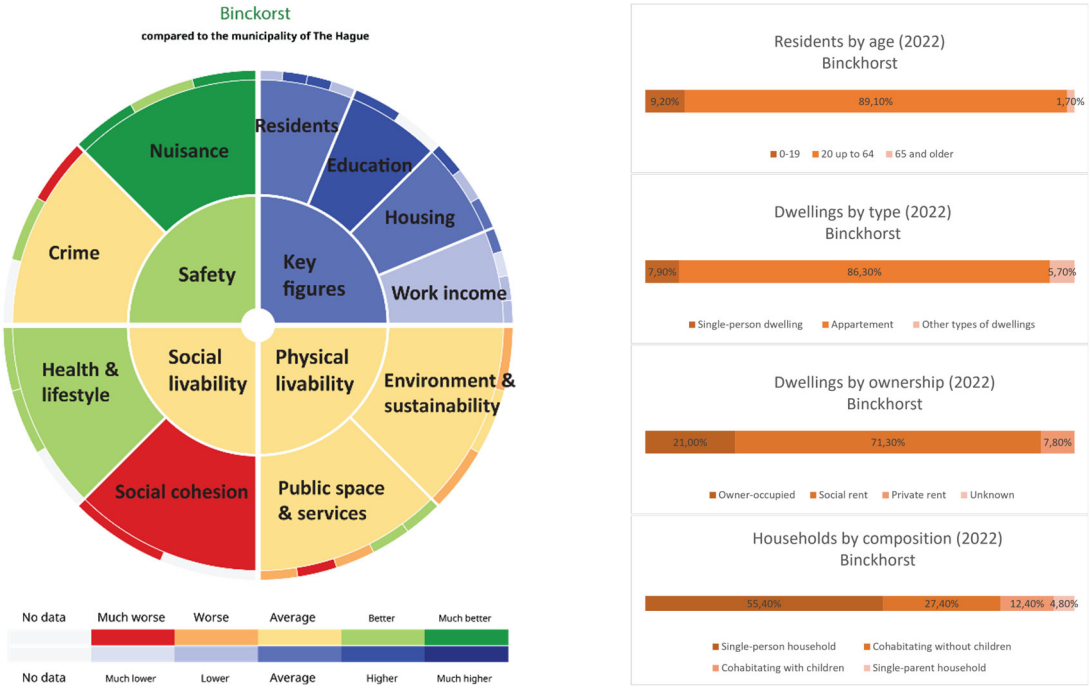


Figure 60: The figure on the left shows the liveability circle for Binckhorst, showing how the neighbourhood compares to other neighbourhoods in the Hague. The figure on the right shows different statistics for the neighbourhood (Municipality of The Hague, N.D.-a, N.D.-b)

Binckhorstlaan 117 in Binckhorst

Below is a text describing the direct environment in which the building is located. The building along Binckhorstlaan 117 has its parking lot. In the direct environment, there are no trams. However, bus lines are going through the area, and the Holland Spoor train station is approximately 1400 meters away. There is a shop for daily necessities approximately 700 meters away, basic medical facilities available in the area (e.g., physio, pharmacy, general practitioner) and sports facilities. The area, however, lacks greenery, neighbourhood meeting places, and educational facilities for children (however, there is one middle school 700 meters away). Furthermore, the building is surrounded by busy rounds leading commuters out of and into The Hague.

Saturnusstraat 9 in Binckhorst

Below is a text describing the direct environment in which the building is located. The building along Saturnusstraat 9 is in an area with many office buildings of a similar size. The buildings in this area have private parking spaces, and the closest parking lot is approximately 800 meters away. Bus lines are going through the area, and next to that, the closest train station (Station Voorburg) is 850 meters away. This building is quite far from the city centre and the closest shop for daily facilities is approximately 1700 meters away. There are indoor sports venues, and a general practitioner and a physical therapist are nearby. This area of the Binckhorst also has hospitality venues. In this area, there is a middle school approximately 850 meters away. However, there are no other educational facilities in the direct vicinity of the building. The area also has zero parks or neighbourhood meeting places in the direct vicinity of the building.

Zonweg 33 in Binckhorst

Below is a text describing the direct environment in which the building is located. The building along Zonweg 33 is next to an asphalt factory. Next to the building, there is also a large cemetery. Although parking on the street is possible around the building, no parking lots are nearby. There are also no parking spaces for shared cars in the direct vicinity of the building. The building is

accessible by bus lines that go through the area, and next to that, the Voorburg train station is close by (1200 meters). This city centre is approximately 3400 meters away, and the closest shop for daily activities is also far away (1400 meters). Next to this is a general practitioner in the area, a physical therapist, and indoor sporting venues. This area has no educational facilities.

Laakkwartier en Spoorwijk (Laakhaven-Oost and Laakhaven-West)

Two buildings are in the Laakkwartier en Spoorwijk area: the building along the Waldorpstraat 80 and the Calandstraat 12. Laakhaven has two sides, which are separated by the river Laak. The northern side of the Laak is a former industrial area that is slowly being transformed into a mixed urban area as more dwellings are added. This transformation started in the 80s. The character of Laakhaven-west is also being transformed as more developments are taking place in this area. This area has a particular character due to the industrial heritage, which has been transformed, and the cranes. The eastern side of the Laak mainly consists of social dwellings in high-rise flat buildings built between 1971 and 2000. This area has a large amount of poverty, unemployment, and socioeconomic problems. The Hague is considered a student city, and several educational facilities are in Laakaven (e.g., ROC Mondriaan, Haage Hogeschool). Within this area, there are opportunities to develop more student dwellings. Regarding facilities, the area has a large shopping mall and many office buildings. The centre of this area is formed by the RAC-hallen and the Maakhaven (Municipality of The Hague, 2015j).

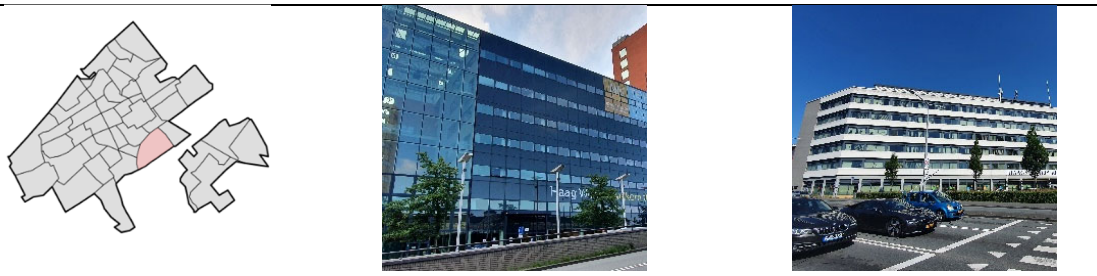


Figure 61: Location of Laakkwartier en Spoorwijk in The Hague followed respectively by an image of the building along the Waldorpstraat 80 and the Calandstraat 12(Centraal Bureau voor de Statistiek & Topografische Dienst Kadaster, 2008h) (Google Earth, N.D.; Vastgoeddata, 2023)

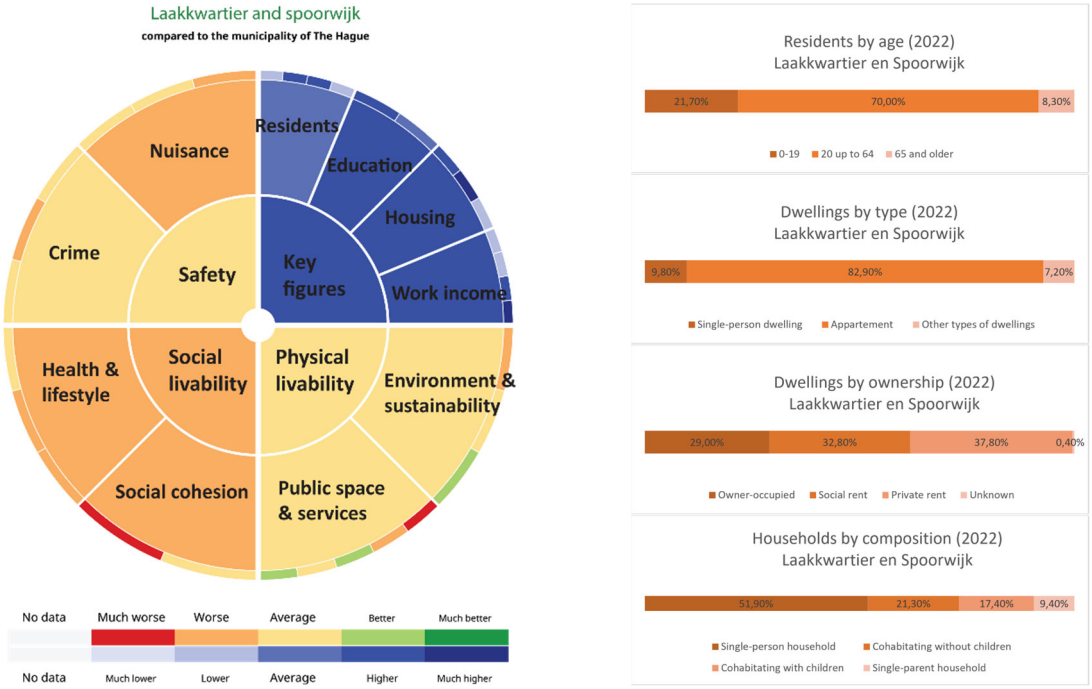


Figure 62: The figure on the left shows the liveability circle for Laakkwartier en Spoorwijk, showing how the neighbourhood compares to other neighbourhoods in the Hague. The figure on the right shows different statistics for the neighbourhood (Municipality of The Hague, N.D.-a, N.D.-b)

Waldorpstraat 80 in Laakkwartier en Spoorwijk

Below is a text describing the direct environment in which the building is located. The building along Waldorpstraat 80 is located directly in front of the Holland Spoor train station. This also means there are bus lines, a bus stops directly in front of the building, and tram lines going through the area. At the back of the building along the quay is a water party, and under that, there is a large parking lot. There is a high concentration of facilities in the direct vicinity of this building, including multiple shops for daily necessities, indoor sports venues, hospitality, basic medical facilities, a middle school, and the Haagse Hogeschool.

Calandstraat 12 in Laakkwartier en Spoorwijk

Below is a text describing the direct environment in which the building is located. The building along Calandstraat 12 has its parking lot. Next to that, in the vicinity, there are also parking garages, parking spaces for shared cars, and charging stations for electric cars. The area has great accessibility. There is a bus stop in front of the building, a tram stops 450 meters away, and the Hague HS train station is less than 1 kilometre away. This area has a lot of trafficking cars through it, as well as trains that pass in front of the building. This might impact the possibility of adding balconies to the building as noise nuisance is an issue.

Near the building is also a shopping centre with shops for daily necessities. The area also has a few wholesale and hardware stores (e.g., Gamma). Aesthetically and dimensionally, these buildings do not align with home-seekers' wishes. This area has seen several new-built buildings being developed in recent years. The area also has bars, restaurants, basic medical facilities, and indoor and outdoor sports venues.

Loosduinen (Kerketuinen and Zichtenburg)

Two buildings are in Loosduinen along the Kerketuinenweg 2 and De Werf 13. Kerketuinen and Zichtenburg is an area within Houtwijk created in the 70s and 80s. The Houtwijklaan splits the area into a Houtwijk-North, which mainly contains single-family owner-occupied dwellings, and Houtwijk-South, which mainly contains flat and apartment buildings. More than half of the dwellings in this area are owner-occupied, and a great majority is found in the social housing stock owned by corporations. Furthermore, there are two elementary schools in Houtwijk and a ROC Mondriaan. The ZKD site is a large industrial park in the neighbourhood. Furthermore, Houtwijk also has a shopping mall along the Hilde Kroplaan (Municipality of The Hague, 2015k).

Figure 63: Location of Loosduinen in The Hague followed respectively by an image of the building along the Kerketuinenweg 2 and De Werf 13(Centraal Bureau voor de Statistiek & Topografische Dienst Kadaster, 2008i; Google Earth, N.D.; Vastgoeddata, 2023)

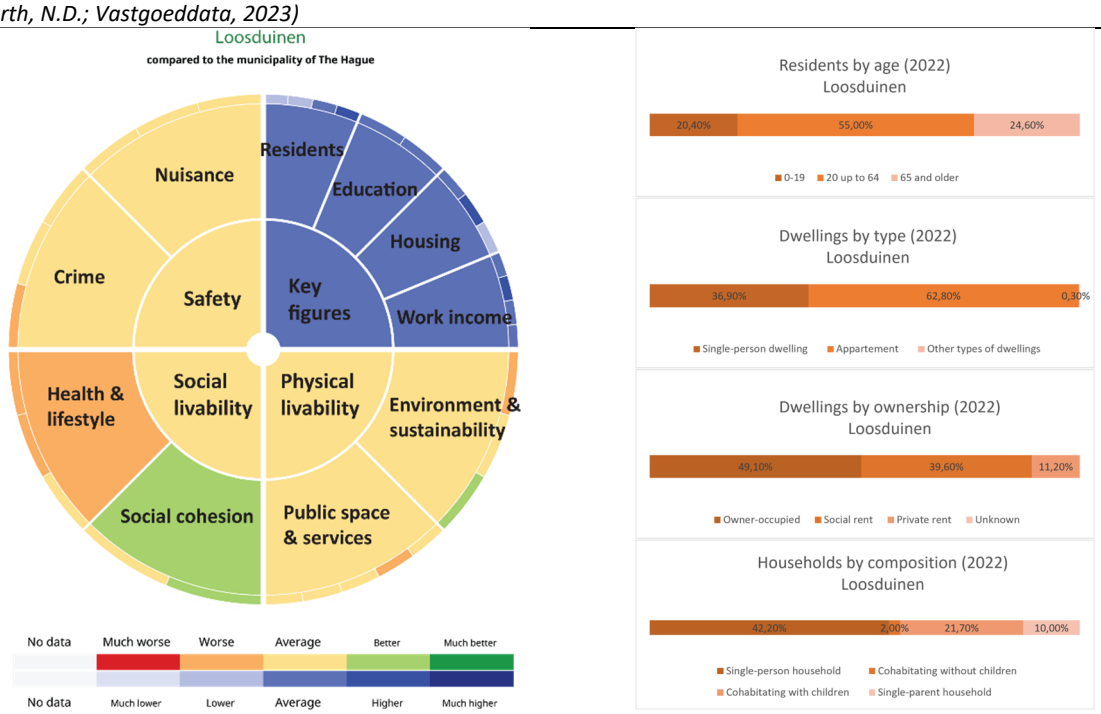


Figure 64: The figure on the left shows the liveability circle for Loosduinen, showing how the neighbourhood compares to other neighbourhoods in the Hague. The figure on the right shows different statistics for the neighbourhood (Municipality of The Hague, N.D.-a, N.D.-b)

Kerketuinenweg 2 in Loosduinen

Below is a text describing the direct environment in which the building is located. The building along Kerketuinenweg 2 has parking arranged on its site. Behind the building, there is a large parking area. Next, there are also parking charging stations for cars near the building. This building, located on an industrial site, is not readily accessible by public transport. The building is also far removed from the city centre (approximately 4600 meters away).

The closest shop for daily necessities is 950 meters away (Albert Heijn), and basic medical facilities can be found directly near the building, including a hospital less than 1 kilometre away (Hagaziekenhuis). Next to that, there is a park (Florence Nightingale) close by, as well as a gym. No educational facilities are present in the direct vicinity of the building.

De Werf 13 in Loosduinen

Below is a text describing the direct environment in which the building is located. The building along De Werf 13 has parking arranged along the street. There is a bus stop approximately 300 meters from the building. However, there are no tram stops in the direct vicinity of the building, and the closest train station is also more than five kilometres away. Furthermore, this train station (Station Moerwijk) is small. There is a supermarket close by (Hoogvliet). However, except for a physical therapist, there do not seem to be any other basic medical facilities, cultural venues, or parks in the area. There is an indoor sports venue and a middle school near the building.

Haagse Bos (Haagse Bos)

Two buildings are in the Haagse Bos along the Bezuidenhoutseweg 60 and the Koningskade 40. Bezuidenhout Midden Oost is a densely populated living area with good connections to public transport and many facilities. The Haagse Bos is located within Bezuidenhout Midden Oost. The average education level of the residents of Bezuidenhout is high, and the neighbourhood is populated predominantly by starters and young professionals. A lot of the dwellings in Bezuidenhout are not suitable for the elderly. However, there is a need to provide suitable dwellings for the elderly within this area. During the Second World War, this neighbourhood was bombed and partly destroyed. Thus, office buildings were constructed during the reconstruction period, and a few dwellings were built as flats. The Beatrixkwartier attracts many people as it is a large office location in the Netherlands. Furthermore, the municipality stimulates the transformation of vacant buildings in this area into dwellings for specific target groups (Municipality of The Hague, 2015f).

Figure 65: Location of Haagse Bos in The Hague followed respectively by an image of the building along the Bezuidenhoutseweg 60 and the Koningskade 40(Centraal Bureau voor de Statistiek & Topografische Dienst Kadaster, 2008g)Vastgoeddata, 2023 #120}(Google Earth, N.D.)

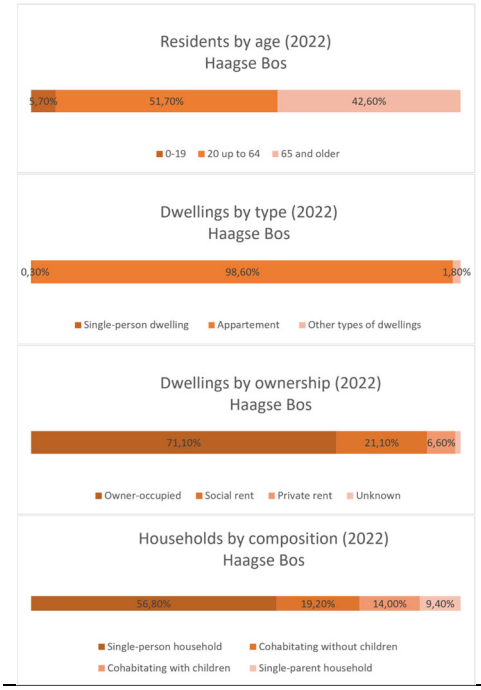


Figure 66: The liveability circle for Haagse Bos does not exist. The figure on the right shows different statistics for the neighbourhood (Municipality of The Hague, N.D.-a, N.D.-b)

Bezuidenhoutseweg 60 in Haagse Bos

Below is a text describing the direct environment in which the building is located. The building along Bezuidenhoutseweg 60 has its parking on the site. Next, there are also charging stations for electric cars near the building. The building is easily accessed by public transport. There is a bus stop 130 meters away and a tram stop 800 meters away. The Hague Central Station is the closest train station, 800 meters away. The area is approximately 2 kilometres from the city centre, and there is a shop for daily necessities less than 300 meters away (Albert Heijn). There is hospitality in the direct vicinity of the building as well as basic medical facilities (e.g., physical therapist, pharmacy, general practitioner). There is an indoor sports venue close to the Central Station, and next to the building, there is a large green space (The Haagse Bos). There are no middle schools in the direct vicinity of the building. However, there is a high school not far away.

Koningskade 40 in Haagse Bos

Below is a text describing the direct environment in which the building is located. The building along Koningskade 40 has a parking garage accessible from the side of the building. Next, there is a parking space for shared cars near the building. The building is also quite well accessible by public transport as there is a bus stop 400 meters away and a tram stop 250 meters away. The closest train station, The Hague Central Station, is a bit more than 1 kilometre away.

There is a supermarket nearby, as well as bars and restaurants in the vicinity of the building. Next to that, there are also basic medical facilities nearby (e.g., physical therapist, pharmacy, and general practitioner). There is a theatre nearby (Koninklijke Schouwburg), a gym, a middle school, and a high school.

Mariahoeve en Marlot (Burgen en Horsten)

One building was found in Mariahoeve along the Bordewijklaan 15. Mariahoeve is a neighbourhood set up in the 1960s with a spacious and green character. This neighbourhood is deemed to have cultural and historical value. Each area comprises a mix of different types of dwellings (e.g., houses, flat buildings, owner-occupied, corporation-owned). Each area in the neighbourhood has its school, a shopping street, and public facilities. A shopping mall can be found along the central axis, which runs through the neighbourhood and forms its hub. Within this area, the cheapest social dwellings can be found. The elderly and parents enjoy living in Mariahoeve (Municipality of The Hague, 2015h).

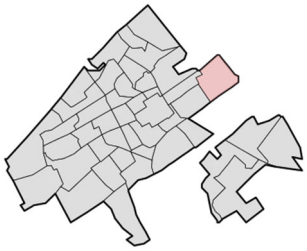


Figure 67: Location of Mariahoeve and Marlot in The Hague followed by an image of the building along the Bordewijklaan 15(Centraal Bureau voor de Statistiek & Topografische Dienst Kadaster, 2008j; Vastgoeddata, 2023)

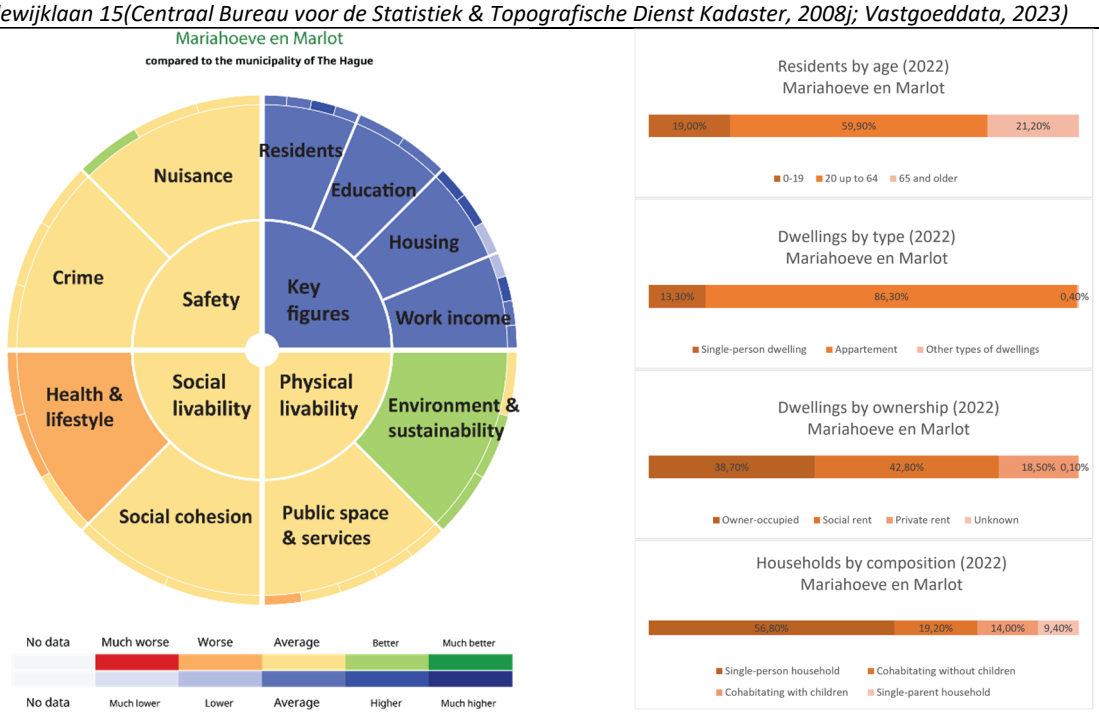


Figure 68: The figure on the left shows the liveability circle for Mariahoeve and Marlot, showing how the neighbourhood compares to other neighbourhoods in the Hague. The figure on the right shows different statistics for the neighbourhood (Municipality of The Hague, N.D.-a, N.D.-b)

Bordewijklaan 15 in Mariahoeve

Below is a text describing the direct environment in which the building is located. The building along Bordewijklaan 15 has a parking lot below the building. Next, there are also charging stations for electric cars near the building. The building is easily accessible by public transport as the train station Mariahoeve is 600 meters from the building. Moreover, there is a bus and tram stop close by.
The closest shop for daily facilities (Hoogvliet) is approximately 850 meters away, and basic medical facilities are also directly near the building. There are no indoor sporting venues or neighbourhood

meeting places in the direct vicinity. There is a middle school but no high school around the building. The buildings in the direct vicinity are also office buildings and are large in scale.

Zorgvliet (Zorgvliet)

One building was found in Zorgvliet along the Willem Lodewijklaan 10. Zorgvliet is considered a monumental villa neighbourhood, with many buildings being considered a part of the nationally protected cityscape. There are few children and young people, but many old people live there, making accessibility important. Furthermore, there are also many expats in the area. Notable Zorgvliet is home to the Catshuis and the World Forum in the Hague. Zorgvliet is also home to many of the embassies in The Hague. The neighbourhood is also very green and has the Park Zorgvliet. There is a high percentage of owner-occupied dwellings, a low percentage of social rental housing, and many office buildings (Municipality of The Hague, 2015o).

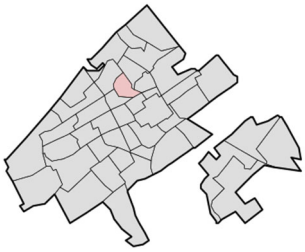


Figure 69: Location of Zorgvliet in The Hague followed by an image of the building along the Willem Lodewijklaan 10(Centraal Bureau voor de Statistiek & Topografische Dienst Kadaster, 2008n; van Reeken, 2018)

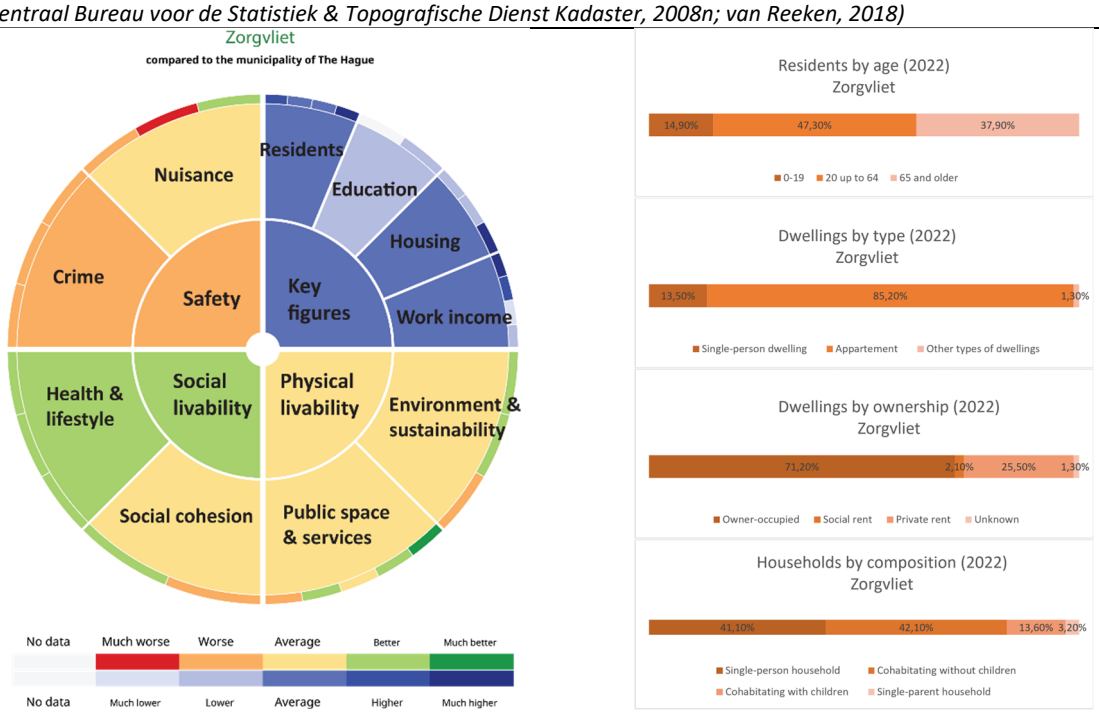


Figure 70: The figure on the left shows the liveability circle for Zorgvliet, showing how the neighbourhood compares to other neighbourhoods in the Hague. The figure on the right shows different statistics for the neighbourhood (Municipality of The Hague, N.D.-a, N.D.-b)

Willem Lodewijklaan 10 in Zorgvliet

Below is a text describing the direct environment in which the building is located. The building along Willem Lodewijklaan 10 is easily accessible by public transport as the train station (The Hague

Central Station) is 3600 meters from the building. Moreover, next to that, there is a bus and tram stop close by. There is an Albert Heijn 850 meters from the building, and bars and restaurants are nearby. The area is green and borders a large park (Zorgvliet). There are basic medical facilities in the vicinity, as well as both indoor and outdoor sports venues. Lastly, there is a middle school and a high school.

Centrum (Voorhout)

Four buildings were in the Centrum: the building along the Lange Voorhout 13, the Prinsessegracht 21, the Lange Houtstraat 4 and the Oranjestraat 15. This area of the centre of the Hague is known for the Binnenhof, the Hofvijver, palace Noordeinde and the city hall. This historical city centre is part of the protected cityscape and contains many monumental buildings, stately avenues, and squares. Furthermore, the centre is also the core shopping area of the Hague, as well as several hospitality hubs and a wide variety of cultural institutions and museums. Next to that, the centre also has space for large-scale events (e.g., at Malieveld). The city centre is the economic engine of the Hague. The municipality stimulates the addition of more dwellings to the city centre through new buildings, living above retail and transforming office buildings into dwellings (Municipality of The Hague, 2015b).

Figure 71: Location of Centrum in The Hague followed respectively by an image of the building along the Lange Voorhout 13, the Prinsessegracht 21, the Lange Houtstraat 4 and the Oranjestraat 15(Centraal Bureau voor de Statistiek & Topografische Dienst Kadaster, 2008e)

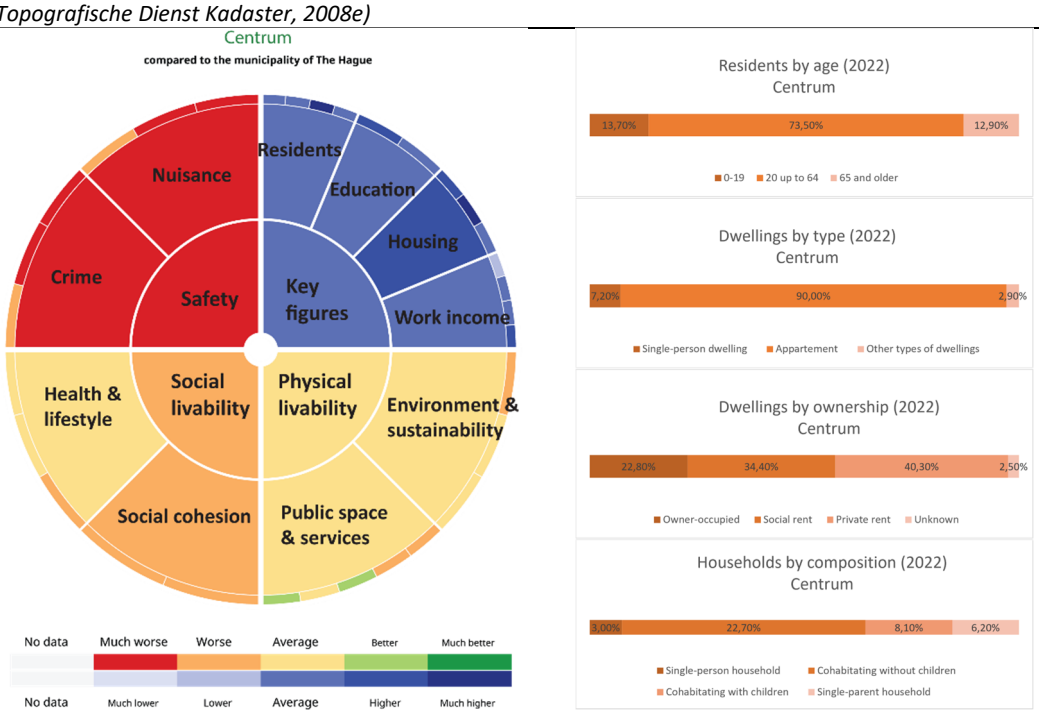


Figure 72: The figure on the left shows the liveability circle for Centrum, showing how the neighbourhood compares to other neighbourhoods in the Hague. The figure on the right shows different statistics for the neighbourhood (Municipality of The Hague, N.D.-a, N.D.-b)

Lange Voorhout 13 in the Centrum

Below is a text describing the direct environment in which the building is located. The building along Lange Voorhout 13 is in the city centre and, therefore, has good accessibility to many facilities such as bars and restaurants and basic medical and educational facilities. There are also cultural facilities in the immediate vicinity (e.g., Pathé Buitenhof, Koninklijke Schouwburg). Nearby, there is a middle school and a high school.

Next to that, in front of the building, there is a beautiful avenue where events are hosted (e.g., Christmas markets). This building is in the middle of the museum quarter of the Hague. The Hofvijver and the Binnenhof are also close to the building.

Prinsessegracht 21 in the Centrum

Below is a text describing the direct environment in which the building is located. The building along Prinsessegracht 21 is close to The Hague Central Station, with a bus stop and a tram stop close to the building. The closest store for daily activities is a bit more than 1 kilometre away. However, there are restaurants and bars and basic medical and cultural facilities near the building. This building is quite close to the University of Leiden and a middle school nearby. The building is situated along a busy road (Koningskade), and across this road, the Malieveld can be found (a green field where large-scale events such as protests, festivals and fairs are held). The forest Haagse Bos is also in the vicinity of this building.

Lange Houtstraat 4 in the Centrum

Below is a text describing the direct environment in which the building is located. The building along Lange Houtstraat 4 is centrally located and is easily accessible by public transport. The Hague Central Station is less than 1 kilometre away, and the tram and bus stops are less than 500 metres away. There are also parking spots for shared cars and a parking lot nearby. There are plenty of bars and restaurants in the vicinity and basic medical and cultural facilities. Regarding educational facilities, there is a middle school and a university in the vicinity.

Oranjestraat 15 in the Centrum

Below is a text describing the direct environment in which the building is located. The building along Oranjestraat 15 has its parking lot below it, and next to that, in the vicinity, there are also parking spots for shared cars. The building being in the city centre, the building is well accessible. There is a bus and tram stop less than 250 meters away (bus and tram stop Kneuterdijk). Next to that, the building is near The Hague Central Station. In the city centre, there are plenty of bars and restaurants in the vicinity, shops for daily facilities, and some essential medical facilities such as physical therapists and a pharmacy. Cultural venues (e.g., theatre and cinema) can also be found near the building. Lastly, there are also indoor sports venues in the vicinity. There is a middle school and a high school in the area.

Benoordenhout (Arendsdorp)

One building was found in Benoordenhout along the Oostduinlaan 2. Benoordenhout is a neighbourhood located northeast of the city centre of The Hague. The neighbourhood is home to valuable architecture, and the entire area is considered a nationally protected cityscape. Next, the large green areas (e.g., Oostduin, Haagse Bos) give the area a green character. The area houses a relatively large number of families and many elderly people. Furthermore, this is an affluent neighbourhood with a very low percentage of unemployment. Most of the dwellings in this area are single-family owner-occupied. Next to that, Duinzigt has many care facilities and apartment buildings for the elderly. Transformation of vacant buildings into dwellings in this area is promoted (Municipality of The Hague, 2015e).

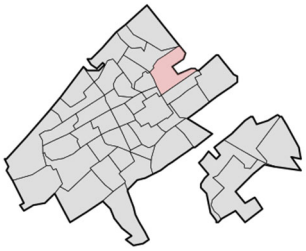


Figure 73: Location of Benoordenhout in The Hague followed by an image of the building along the Oostduinlaan 2(Centraal Bureau voor de Statistiek & Topografische Dienst Kadaster, 2008b; Vastgoeddata, 2023)

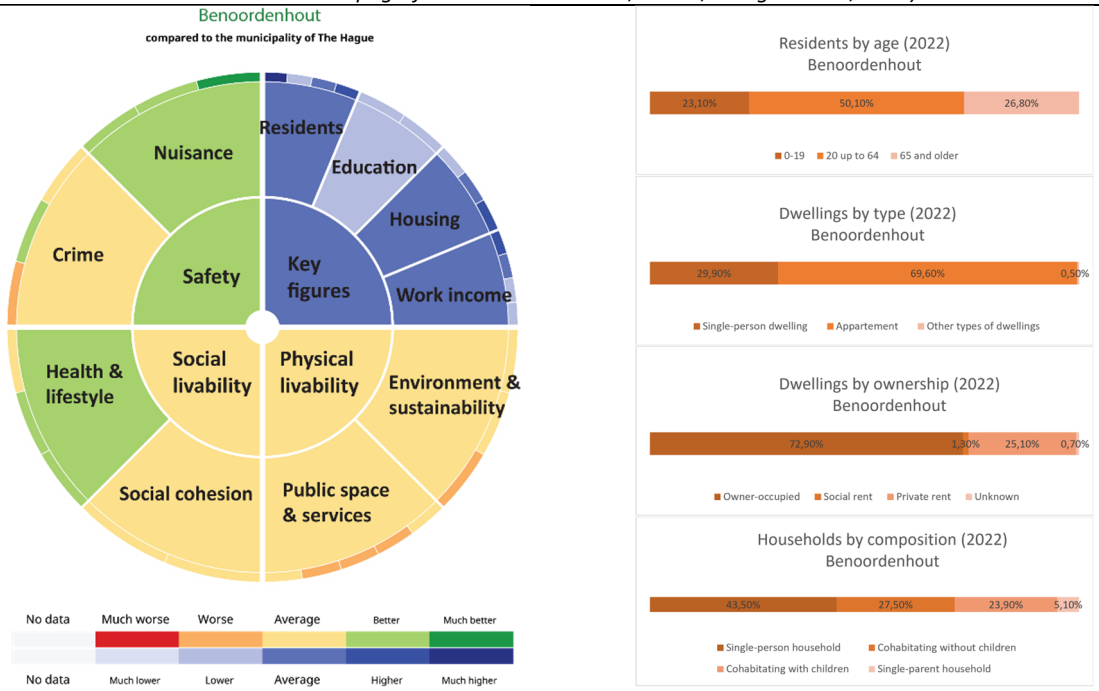


Figure 74: The figure on the left shows the liveability circle for Benoordenhout, showing how the neighbourhood compares to other neighbourhoods in the Hague. The figure on the right shows different statistics for the neighbourhood (Municipality of The Hague, N.D.-a, N.D.-b)

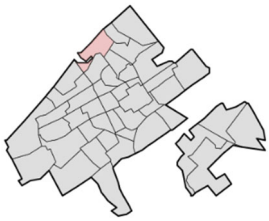
Oostduinlaan 2 in Benoordenhout

Below is a text describing the direct environment in which the building is located. The building along Oostduinlaan 2 has its parking lot in the back. Next to that, the building is easily accessible by bus, tram, and train. The bus line is approximately 250 meters away, the closest tram stop is approximately 400 meters away, and The Hague Central Station is less than 2 kilometres away.

There is a supermarket less than one kilometre away (Albert Heijn), and there are bars and restaurants in the vicinity as well as basic medical facilities (e.g., general practitioner, physical therapist, pharmacy). The closest indoor sporting vicinity is less than 500 meters away, and across the building, there is a large park (Oostduin Park). There are also outdoor sporting venues nearby, namely a cricket and soccer field approximately 1200 meters away. Lastly, the area has its own middle school and high school.

Scheveningen (Visserijbuurt)

One building was found in Scheveningen along The Kerklaan 195. This neighbourhood forms the core of old Scheveningen and is between the haven and the seaside. The neighbourhood has a main shopping street, the Badhuisstraat. The narrow streets and densely built courtyards give the impression of an authentic fishing village. The neighbourhood also has a swimming pool, the blinkerd. More than half of the dwellings in this area are owner-occupied. Of the rental dwellings, approximately 60% are found in the private rental segment, and the rent is in the social housing segment (Municipality of The Hague, 2015l).



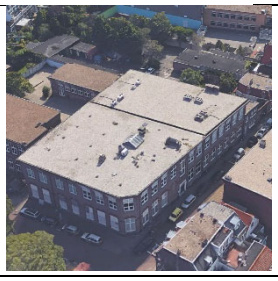


Figure 75: Location of Scheveningen in The Hague followed by an image of the building along the Kerklaan 195(Centraal Bureau voor de Statistiek & Topografische Dienst Kadaster, 2008l; Google Earth, N.D.)

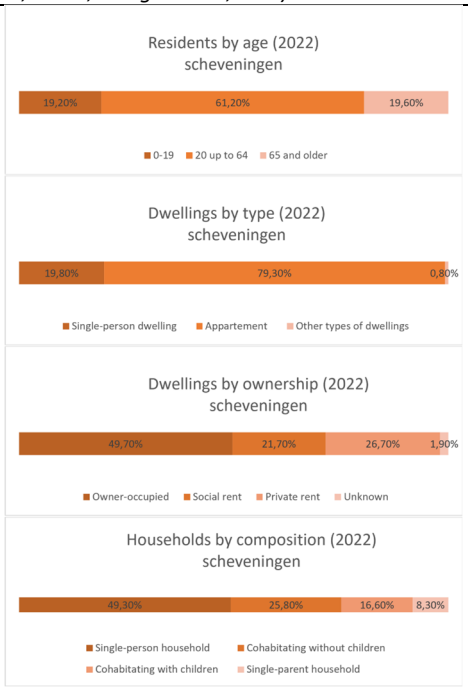


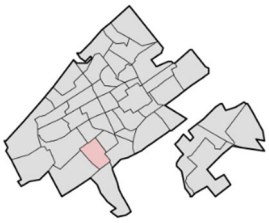
Figure 76: The figure on the left shows the liveability circle for Scheveningen, showing how the neighbourhood compares to other neighbourhoods in the Hague. The figure on the right shows different statistics for the neighbourhood (Municipality of The Hague, N.D.-a, N.D.-b)

Kerklaan 195 in Scheveningen

Below is a text describing the direct environment in which the building is located. The building along Kerklaan 195 has parking arranged on the street in front of it. This area also has a parking space for shared cars in the vicinity. The building is also easily accessed by public transport as there is a bus stop approximately 450 meters away, a tram stop approximately 350 meters away, and the main train station, The Hague Central Station, is 4100 meters away. The area also has a shop for daily necessities and basic medical facilities (e.g., physical therapist, pharmacy, and general practitioner). In the direct vicinity of the building, there are indoor and outdoor sports venues and a swimming pool 450 meters away. In front of the building is a small square with trees and communal garbage bins. In the vicinity, there is also a high school.

Morgenstond (Morgenstond-Zuid)

One building was found in Morgenstond along the Leggelostraat 85. Morgenstond was constructed post-war in Escamp. Most dwellings created in this neighbourhood are part of the social housing stock. The owner-occupied dwellings were built in new-built locations, and as a result, there are significant differences between the new and old stock in appearance and population composition. Along the central axis of the neighbourhood, the Leyweg, there is a large shopping mall and a variety of facilities. Furthermore, there is also a neighbourhood theatre (Dakota). In Leyenburg, the adjacent neighbourhood, there is a hospital and many medical facilities (Municipality of The Hague, 2015d).



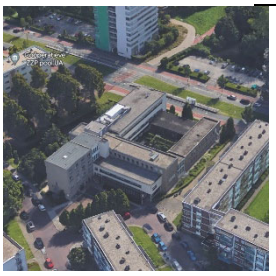


Figure 77: Location of Morgenstond in The Hague followed by an image of the building along the Leggelostraat 85(Centraal Bureau voor de Statistiek & Topografische Dienst Kadaster, 2008k; Google Earth, N.D.)

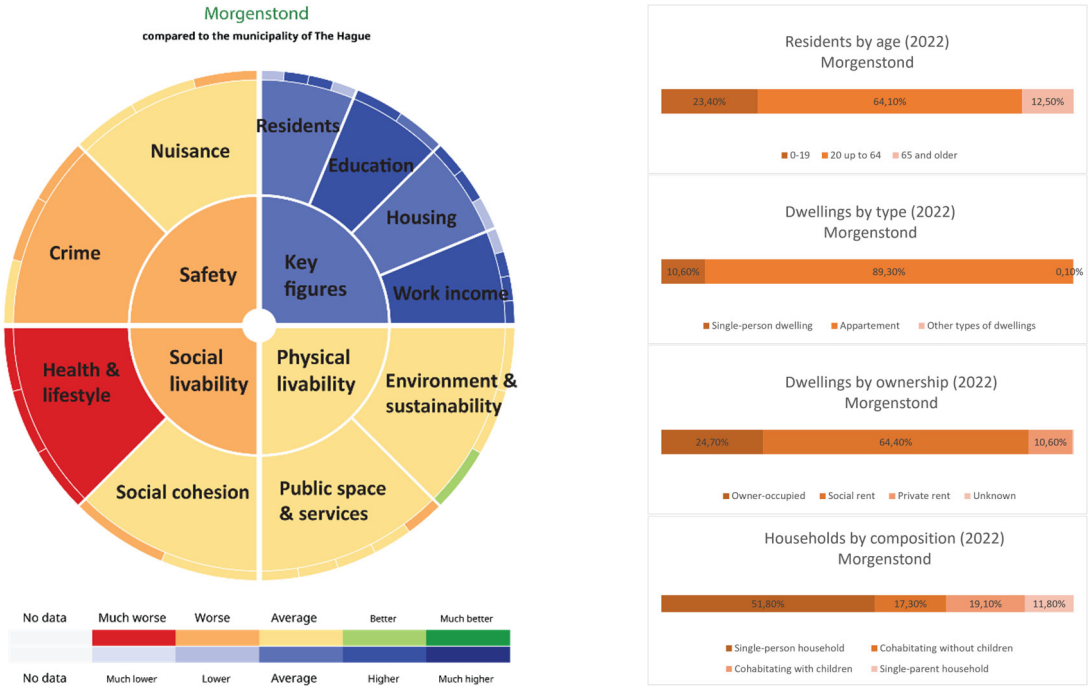


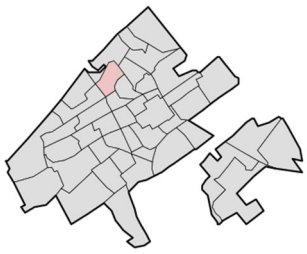
Figure 78: The figure on the left shows the liveability circle for Morgenstond, showing how the neighbourhood compares to other neighbourhoods in the Hague. The figure on the right shows different statistics for the neighbourhood (Municipality of The Hague, N.D.-a, N.D.-b)

Leggelostraat 85 in Morgenstond

Below is a text describing the direct environment in which the building is located. The building along Leggelostraat 85 has a parking lot (although these spaces are insufficient), and parking is arranged on the street. A bus stop is close, and a tram stop is in front of the building. The closest train station is less than 3 kilometres away (Station Moerwijk). There is a supermarket less than 100 meters away from the building, and there are also restaurants in the vicinity. As far as basic medical facilities go, there is a pharmacy in the vicinity; however, there are no general practitioners or physical therapists in the direct vicinity of the building. Both indoor and outdoor sports venues are present. However, the closest neighbourhood meeting place is approximately 1 kilometre away. Lastly, there is a high school nearby but no middle school.

Geuzen- and Statenkwartier (Statenkwartier)

One building was found in the Geuzen- and Statenkwartier along the Scheveningseweg 64. The Statenkwartier was constructed royally with wide avenues, streets, and townhouses and was furnished with imposing trees to add to the monumental image. Amongst the residents, there are many expats. The Frederik Hendriklaan forms a



main shopping street for the neighbours. Next, three museums draw people to the area: the Museon, Omniversum and the municipal museum. The Geuzenkwartier houses mostly single-family dwellings and flats. The neighbourhood lacks greenery. Most of the dwellings in the Statenkwartier are owner-occupied, and about a third is social housing. The Geuzenkwartier has mostly (smaller) owner-occupied dwellings (Municipality of The Hague, 2015m).

Figure 79: Location of Geuzen- and Statenkwartier in The Hague followed by an image of the building along the Scheveningseweg 64(Centraal Bureau voor de Statistiek & Topografische Dienst Kadaster, 2008f)Vastgoeddata, 2023 #120}

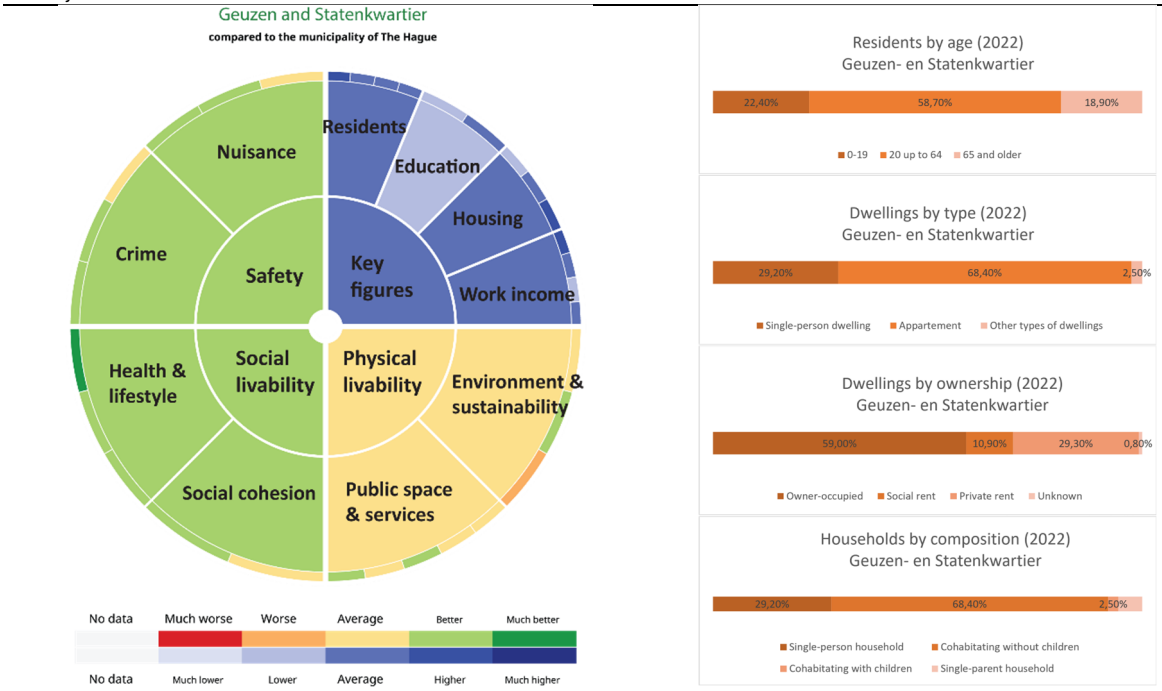


Figure 80: The figure on the left shows the liveability circle for Geuzen- and Statenkwartier, showing how the neighbourhood compares to other neighbourhoods in the Hague. The figure on the right shows different statistics for the neighbourhood (Municipality of The Hague, N.D.-a, N.D.-b)

Scheveningseweg 64 in Geuzen- and Statenkwartier

Below is a text describing the direct environment in which the building is located. The building along Scheveningseweg 64 is located along de Scheveningseweg, a long straight road connecting to the beach. A tramline goes over this road, and the tram stop is nearby. There is also a bus line, and The Hague Central Station is less than 4 kilometres away. Across the building is a large park and forest (Van Stolkpark en Scheveningse Bosjes), and the area generally has much greenery. There are shops for daily necessities in the vicinity and several restaurants. Basic medical facilities, indoor sports venues, and a swimming pool are within a 1-kilometre range. There is a high school in the vicinity. However, there are no middle schools close by.

Westbroekpark en Duttendel (Duttende)

Two buildings have been found in this area, namely the building along the Van Alkemadelaan 786 and the Oude Waalsdorperweg 10. Duttendel is a monumental residential neighbourhood surrounded by dunes and greenery. A large part of the neighbourhood is a protected cityscape. Apartment buildings edge this area, and it houses a monumental prison (Scheveningse gevangenis) and the Westbroekpark, where many events are hosted. The neighbourhood does not have a city centre and lacks facilities. The neighbourhood's population is relatively old (Municipality of The Hague, 2015n).

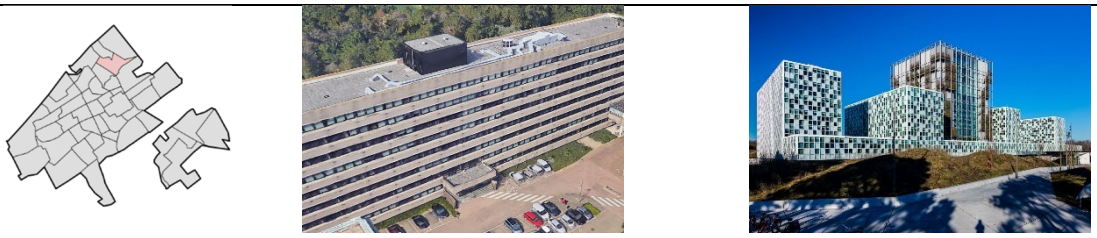


Figure 81: Location of Westbroekpark and Duttendel in The Hague followed respectively by an image of the building along the Van Alkemadelaan 786 and the Oude Waalsdorperweg 10(Centraal Bureau voor de Statistiek & Topografische Dienst Kadaster, 2008m; Google Earth, N.D.; Vastgoeddata, 2023)

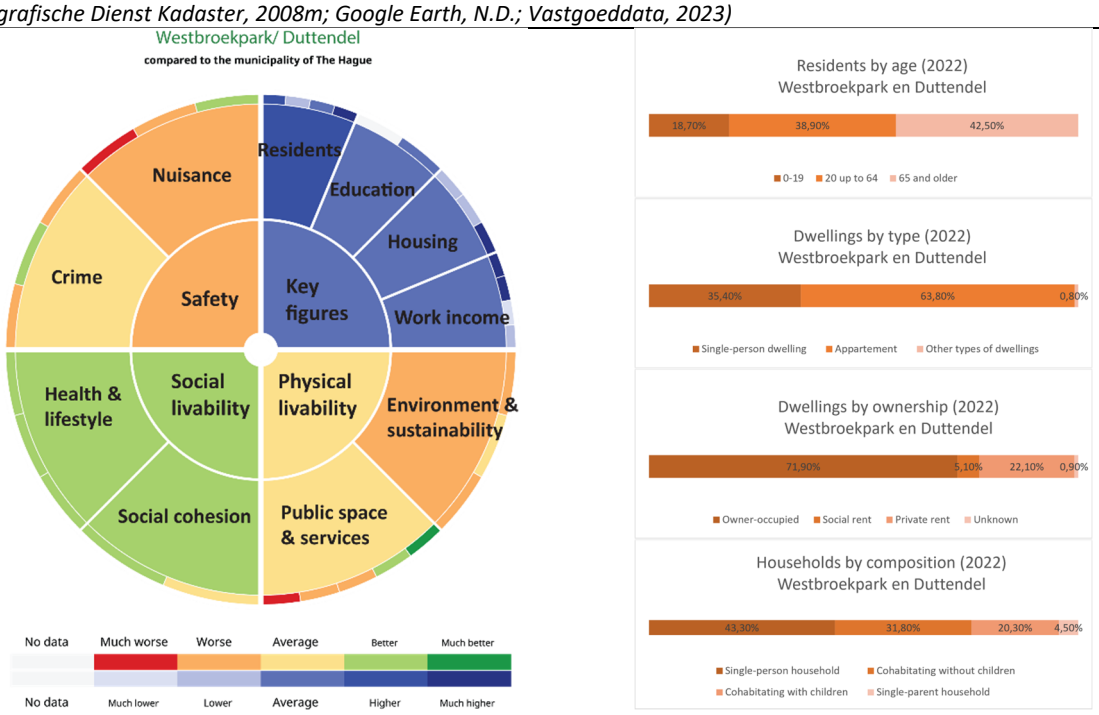


Figure 82: The figure on the left shows the liveability circle for Westbroek, showing how the neighbourhood compares to other neighbourhoods in the Hague. The figure on the right shows different statistics for the neighbourhood (Municipality of The Hague, N.D.-a, N.D.-b)

Van Alkemadelaan 786 in Duttendel

Below is a text describing the direct environment in which the building is located. The building along Van Alkemadelaan 786 is based on a military barrack, which is still used today. The barracks, being private property, are accessed through gates. On the premises, there are parking spots scattered between the buildings. There are no bus or tram stops in the direct vicinity of the building. However, the closest train station (The Hague Central Station) is approximately 3500 meters away. The area has a shop for daily necessities, bars, restaurants, and basic medical facilities. The Bronovo Hospital is also nearby (800 meters away). Other than that, there are no nearby sports venues or educational

facilities. The area also does not have any neighbourhood meeting places. However, a large nature reserve is next to the military barracks, formed by The Hague's dunes landscape.

Oude Waalsdorperweg 10 in Duttendel

Below is a text describing the direct environment in which the building is located. The building along Oude Waalsdorperweg 10 has a parking lot on its property. Next to that, the building is accessible by bus as there is a bus stop in front of the building, and The Hague Central Station is less than 4 kilometres away. Although the city centre is relatively far away, there are shops for daily activities in the direct vicinity of the building, as well as bars and restaurants and basic medical facilities. The Bronovo Hospital is also approximately 600 meters away. This area does not seem to have sports venues in its direct vicinity. Next to the building, there is a large nature reserve formed by the dunes in The Hague. Adjacent to the building, there is a military Barack still in use. There are middle school and high schools in the area.

The entrance to the Huburtustunnel is a few meters away from the building, and this tunnel passes in front of the building. This tunnel- along with the Sijtwendetunnel (in Leidschendam), provides a quick connection between Scheveningen and the A4 highway and relieves traffic from the A12 highway (also called the Utrechtsebaan) and the Waalsdorperweg.

Appendix B

Step 2b: Feasibility scan using gradual criteria at the building level

Building 1 (Alexanderveld 125)

Built year: 1958
Usable area: 48.317 m²
Energy label: G
Zoning plan: 'Public Interest - 1'
Listed monument: No, but partly a municipal monument

(Ruimtelijke Plannen, N.D.; Vastgoeddata, N.D.)

Figure 83: Alexanderveld 125 (Vastgoeddata, N.D.)

History of building

This building served as the police headquarters in the Hague and was built in 1959 based on the design of Wouter Sybrand van de Erve. After the Second World War, the police were housed in several buildings along the Burgemeester Patijnlaan and the Burgemeester van Karnebeeklaan. In 1948, the decision was made to build a headquarters in the same location, which led to demolishing several buildings on the plot. The headquarters opened in 1957, and the first expansion occurred in 1981.

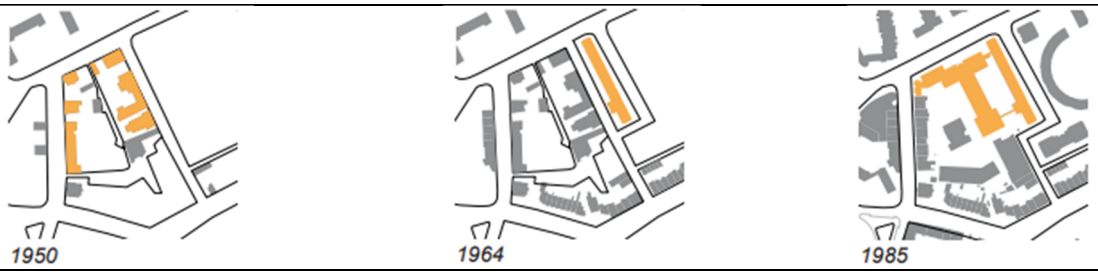


Figure 84: Historical development of the police station (Gemeente Den Haag, 2020)

The building, except for the later expansion along the Burgemeester Patijnlaan, is considered a municipal monument due to W.S. van de Erve being one of the prominent architects from the post-war period, and some of his buildings have already been demolished. The building is also valuable for being a representative and well-preserved example of office construction from the reconstruction period (Monumentenzorg Den Haag, N.D.-a). The architect split the building into the working and representative parts. The entrance to the building is found in the representative part and consists of a vast glass entrance framed by a high concrete canopy with reliefs on the inside. Furthermore, the building is extended with a trapezoid at the rear in line with the main entrance. This creates a monumental hall over three levels used for meetings. A second large trapezoidal hall can be found at the very top, the film and instruction hall, which has a beautiful spatial effect due to its sloping roof and rising windows. The rest of the building is set up in the traditional sense, with office spaces across one another, which are connected through a centre corridor (Gemeente Den Haag, 2020).



Figure 85: The monumental part of the building, the inside of the film and instruction hall and the main entrance from the inside (Gemeente Den Haag, 2020; Monumentenzorg Den Haag, N.D.-a)

Functional and cultural aspects

In 2018, the decision was made to build a new headquarters for the police in Binckhorst, which should be delivered in 2023, as renovating the current headquarters was deemed financially less feasible than building the new headquarters. After the construction of the new headquarters in the Binckhorst, this property will no longer be used by the police and will be divested. This is not the only building the police will divest once the headquarters is finished. The buildings along the Elisabethhof in Leiderdorp, the Parkweg in Voorburg and the Overgoo in Leidschendam will also become redundant.

Next to that, according to (Vastgoeddata, 2023), a part of the building is also rented out to Parnassia Groep by the real estate agent Amgea Bedrijfsmakelaars.

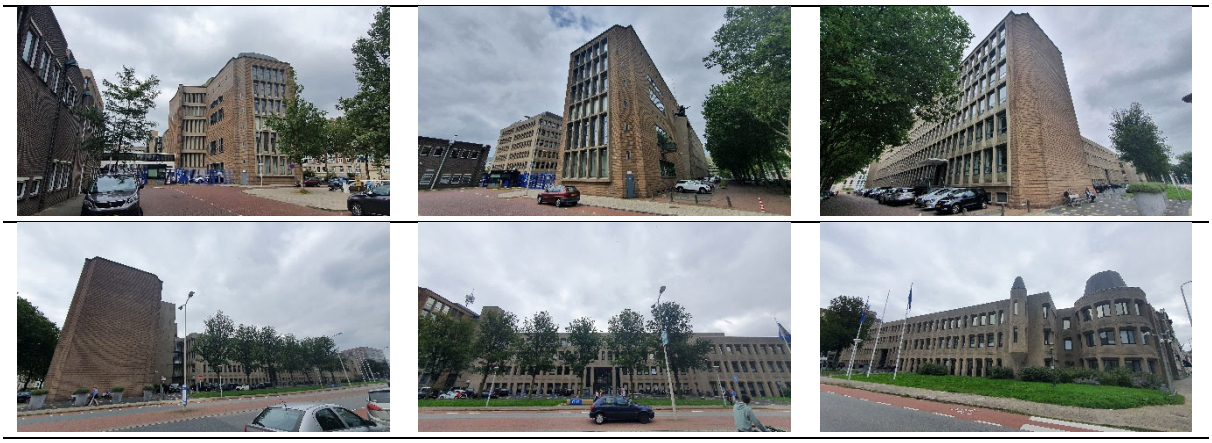


Figure 86: Selection of pictures of the building along the Alexanderveld 125 showing the monumental part of the building (pictures 1, 2 and 3) and the front side of the part of the building that was later added (pictures 4,5 and 6)(Vastgoeddata, 2023)

The building, with a usable area of 48.317 m², has enough capacity to accommodate a new function such as housing. The table below shows a simple calculation of the number of dwellings achievable after discounting 25% of the usable area for circulation. The number of dwellings is rounded off.

Usable area	Usable area minus 25% circulation space	Usable area minus 25% circulation space divided by 30m² dwellings	Usable area minus 25% circulation space divided by 50m² dwellings	Usable area minus 25% circulation space divided by 75m² dwellings
48.317 m²	36.237,75 m²	*1.208 dwellings*	*725 dwellings*	*483 dwellings*

Topping up the monumental part of the building might be difficult as the municipality will want to preserve this part. Next to that, extending this part of the building might prove difficult as the film and instruction hall roof already sticks out and is slanted, making further developments impossible. Furthermore, the part of the building which was built later also has trapezium-shaped structures

currently on the roof, which most likely cannot be topped up. This part of the building is split into three parts with unaligned roofs.

Underneath the building is a large parking space for 390 cars (1 floor of parking). This parking space is located partly under the ground level and partly under the extension. The parking space is accessed through two ramps (Gemeente Den Haag, 2020). This parking space is an opportunity as it solves some of the parking needs of building users. However, if the whole building is transformed, another solution must be considered for the parking needs as it might not be sufficient (see table regarding parking norms in the previous chapter). Developers are expected to supply sufficient parking space for the dwellings delivered through redevelopment. However, the maximum number of parking spaces can also be minimized if parking spaces for shared cars are provided (Municipality of The Hague, 2021a).

Figure 87: Roof alignment of part of the building, which was later added, plus the trapezoidal extensions on top of the roofs of the buildings (Google Earth, N.D.)

Figure 88: Entrance and exit to the underground parking lot for 390 cars (Google Earth, N.D.)

Technical and legal aspects

During the 21st century, a thorough renovation took place to remove Asbestos, put in a new air conditioning system, improve the lighting, implement better security, and apply a system where heating and cooling are arranged through underground water to control the temperature. Furthermore, the building looks well-kept from the outside.

Elevators are present. Three elevator shoots can be seen sticking out above the roof. The building also has staircases already present.

The office building has a typical office layout consisting of office spaces connected through a corridor. Because of this, the different building parts are deep, ranging between 15 and 24 meters. Nonetheless, the building has windows on both sides of the façade to provide daylight. The table below shows a simple calculation of dwelling sizes based on the depth of the wings of the building (15 meters and 24 meters). For the parts of the building with windows, roughly 30-55% are covered. Of these windows, some can open, and some cannot. Furthermore, the heights between floors are expected to be less than 4 meters (except for parts of the building like the entrance and the conference halls). To illustrate, one wing of the building is approximately 16 meters high and has four floors; without knowing the thickness of the floors, it can already be deduced that the space between the floors is less than 4 meters (AHN, N.D.). The building has six floors at its highest part (Vastgoeddata, 2023).

Depth	Minus 2 meters of circulation	Depth of dwelling given corridor	30m²	50m²	75m²	100m²
A	B=A-2m	C=B/2	D=30/C	E=50/C	F=75/C	G=100/C
15 meters	13 meters	6,5m	4,6m	7,9m	11,53m	15,38m

24 meters 22 meters 11m 2,7m 4,5m 6,8m 9,09m

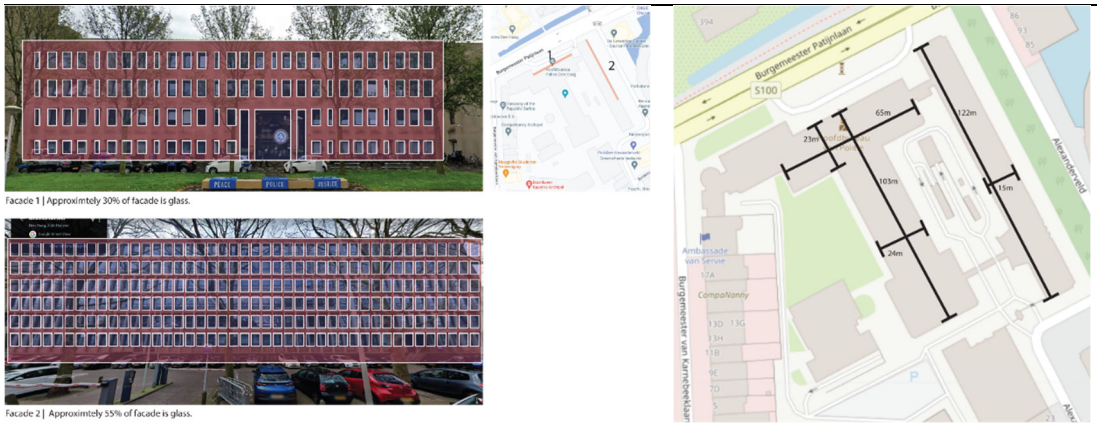


Figure 89: The Rhythm of windows in the façade and plot of Alexanderveld 125 with rough measurements on the edited map from Open Street Map (N.D.)

The zoning plan for the area where the building is located indicates that the ground is designated for 'Public Interest - 1'. This refers to cultural facilities, public services, and police stations.

Figure 90: Alexanderveld 125 (Monumentenzorg Den Haag, N.D.-a)

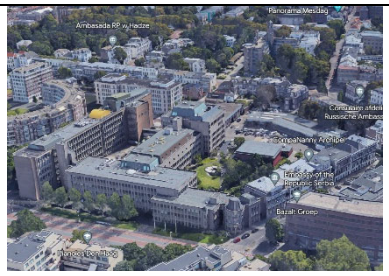


Figure 91: Aerial view of Alexanderveld 125 (Google Earth, N.D.)

Figure 92: plot of Alexanderveld 125 (Kadastrale kaart, N.D.)

Conclusion

Given the size of the building, it is worth exploring the possibility of partially transforming the building into dwellings and maintaining another part as office space. Within this context, it makes sense not to transform the monumental part of the building as the architecture is very particular, whilst the part added later is less interesting architecturally.

Building 2 (Lange Houtstraat 4 (& 8))

Built year: 1906
Usable area: 6144 m²
Energy label: G
Zoning plan: 'office-2'
Listed monument: Houtstraat 4 is not listed. However, it is part of a larger complex of office buildings (Staal), of which Lange Houtstraat 8 is a listed monument.

(Ruimtelijke Plannen, N.D.; Vastgoeddata, N.D.)

Figure 93: Lange Houtstraat 4 (Municipality of The Hague, 2022b)

History of building

The office building along the Lange Houtstraat 4 is a part of a larger complex of office buildings called complex Staal. Complex Staal was previously owned and used by Staalbankiers N.V. from the

establishment of the bank on the Lange Houstraat 8 in 1916 until 2017 when the bank closed. The bank, being located on the exact location for the past 100 years, expanded to the neighbouring buildings resulting in a compartmentalized office complex of approximately 25,000m² and consist of numerous other addresses: (1) Lange Houtstraat 2 (1990), (2) Lange Houtstraat 8 (1916, listed monument), (3) Lange Houtstraat 26 (1986), (4) Korte Vijverberg 2 (1990), (5) Doelenstraat 10 (1990), (6) Tournooiveld 4 (1650; 1775- 1799, previous Hotel du Vieux Doelen, listed monument), (7) Tournooiveld 5 (1774).

The owner of the building is Syntrus Achmea Real Estate & Finance, and they created plans to transform the monofunctional office building into a mix of offices, dwellings (rental segment), hospitality, museum, debate facilities and parking - after Staalbankiers N.V. left the building leaving it vacant. Previously, the plan was to redevelop this complex of buildings into a hotel; however, partly due to the COVID-19 pandemic, they chose to go a different route (Municipality of The Hague, 2022b). Below, a picture of the facades, which are a part of the Complex Staal, can be seen. Of these buildings, Lange Houtstraat 8 is a listed monument.

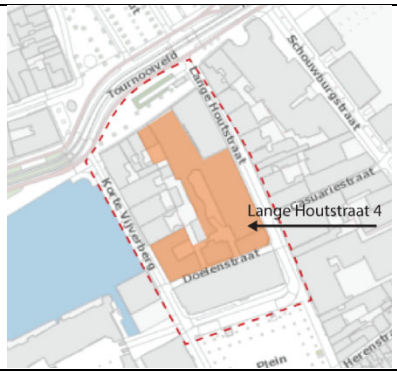


Figure 94: Lange Houtstraat 4 and 8 And complex Staal (orange hatch) and Lange Houtstraat 4(Municipality of The Hague, 2022b)

Functional and cultural aspects

Not much is known about this building or the buildings it is connected to. It is unclear how the logistics are arranged.

The building, with a usable area of 6144m², has enough capacity to accommodate a new function such as housing. The table below shows a simple calculation of the number of dwellings achievable after discounting 25% of the usable area for circulation. The number of dwellings is rounded off.

Usable area	Usable area minus 25% circulation space	Usable area minus 25% circulation space divided by 30m² dwellings	Usable area minus 25% circulation space divided by 50m² dwellings	Usable area minus 25% circulation space divided by 75m² dwellings
6144 m²	4608 m²	153,6 dwellings	92,16 dwellings	61,44 dwellings

Technical and legal aspects

The building is quite deep, and as it is on both sides connected to other buildings, the provision of sufficient daylight might be a problem. Next to that, the backside of the building seems to have many building parts added throughout the years.

Figure 95: Lange Houtstraat 4 and 8 plot with rough measurements on an edited map from Open Street Map (N.D.)

The zoning plan for the area where the building is located indicates that the ground is designated for 'office-2'. This refers to the function of office building.

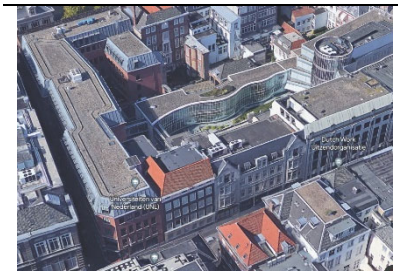


Figure 96: Aerial view of Lange Houtstraat 4 (Google Earth, N.D.)

Figure 97: plot of Lange Houtstraat 4 (Kadastrale kaart, N.D.)

Conclusion Lange Houtstraat 4 (&8)

As mentioned above, there are plans to transform this building into a mixed-use ensemble.

Building 3 (Calandstraat 12)

Built year: 1965
Usable area: 5678 m²
Energy label: E
Zoning plan: 'office'
Listed monument: no

(Ruimtelijke Plannen, N.D.; Vastgoeddata, N.D.)

Figure 98: Calandstraat 12 (Vastgoeddata, N.D.)

History of building

The building was built in 1965; however, little is known about it. It currently houses education facilities that provide language courses and office space for GGZ. The building does not seem to have an interesting background. The building was last bought by a party in 2009 and is currently managed by Jovi Investments (Vastgoeddata, 2023).

Figure 99: aerial view of building on Calandstraat 12(Google Earth, N.D.)

Functional and cultural aspects

The building has six floors, and on top of the sixth floor, there is a small structure extending up (it might be a technical space, or the sixth floor has a part that is higher than the rest). The building is at its highest point, 24,05 meters tall (AHN Bestand). Furthermore, in front of the building, there is an unbuilt area which is currently used as a parking lot (approximately 25 parking spots) and in the back of the building, there is also a narrow area between the building of Calandstraat 12 and a neighbouring structure which is used for parking and services for the building (e.g., dumpster, storage). The building is accessed from the parking lot through a main door in the middle of the façade. Other than that door, the façade is completely closed.

Figure 100: Selection of pictures of the building along the Calandstraat 12 (Vastgoeddata, 2023)

Approximately 700 m² of space in front of the building is used for parking and landscaping. (22 parking spots) This space also serves as a transition from the busy road that constitutes the Waldorpstraat and the Calandstraat, given that these two roads meet at the intersection. Given that the main building is low, it might not make sense to build on this parking lot as the structure would cause issues with daylight.

Behind the building is also a narrow street which provides service to the building (figure below).

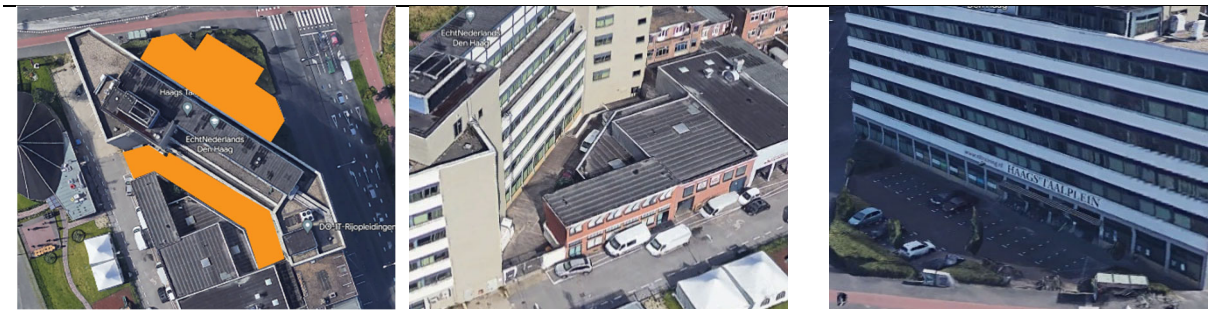


Figure 101: picture of the parking lot in front of the building and the gap between the building and other existing structures (Google Earth, N.D.)

The building has a usable area of 5678 m² and can produce a significant number of dwellings if transformed. The table below shows a simple calculation of the number of dwellings achievable after discounting 25% of the usable area for circulation. The number of dwellings is rounded off.

Usable area	Usable area minus 25% circulation space	Usable area minus 25% circulation space divided by 30m² dwellings	Usable area minus 25% circulation space divided by 50m² dwellings	Usable area minus 25% circulation space divided by 75m² dwellings
5678 m²	4258,5 m²	*142 dwellings*	*85 dwellings*	*57 dwellings*

Technical and legal aspects

Very little is known about when the building was last renovated. However, the building is still actively used daily. Thus, it can be assumed that surface-level renovations have taken place regularly. Furthermore, the building looks old but well-kept at first eye glance.

The building seems to have two cores holding two elevator shafts (4 lifts) that can be repurposed. The staircase is also in the core of the building.

Sound nuisance because of the busy road in front of the building and the train tracks would have to be considered should this building be transformed into housing. This could limit the possibility of adding balconies.

Figure 102: Picture of lift shafts and plot of Calandstraat 12 with rough measurements on an edited map from Open Street Map (N.D.) (Google Earth, N.D.)

Depth	Minus 2 meters of circulation	Depth of dwelling given corridor	30m²	50m²	75m²	100m²
A	B=A-2m	C=B/2	D=30/C	E=50/C	F=75/C	G=100/C
13 m	11 m	5,5m	5, 5m	9,1m	13,6m	18,18m
Corridor along the façade with one row of dwellings						
13 m	11 m	***	2,7m	4,5m	6,8m	9,09m

The building has many windows on both sides. The windows on the first floor are larger and longer. Furthermore, there are no tall structures in front or behind the building and given that the depth of the building is approximately 13m, sufficient daylight should not be an issue.

Figure 103: Rhythm of windows in the façade of Calandstraat 12 (own image)

The zoning plan for the area where the building is located indicates that the ground is designated for an 'office' (Ruimtelijke Plannen, N.D.).

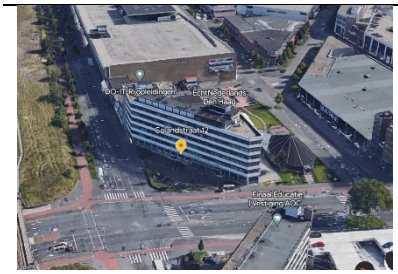


Figure 104: Aerial view of Calandstraat 12 (Google Earth, N.D.)

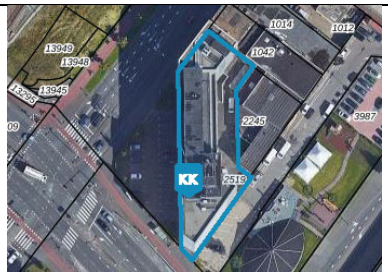


Figure 105: plot of Calandstraat 12 (Kadastrale kaart, N.D.)

Conclusion Calandstraat 12

In theory, the building could be transformed; however, given this area's nature, the plot's redevelopment makes more sense. Reusing the building may not make much sense. The value of the plot of the land might be better used if the building is demolished and the plot is densified. Building itself is anonymous.

Documents found online for a new building on this plot of land. The project is called The Embrace; however, it is unclear in which phase this project is or if permits have already been granted for the demolition and development. However, the concept is to demolish the current building and build three towers containing approximately 1000 dwellings (Van Deursen Group, N.D.).

Building 4 (Scheveningseweg 64)

Built year: 1989
Usable area: 5381m²
Energy label: E, A+
Zoning plan: 'Office'
Listed monument: no

(Ruimtelijke Plannen, N.D.; Vastgoeddata, N.D.)

Figure 106: Scheveningseweg 64 (Vastgoeddata, N.D.)

History of building

The building was built in 1989; however, next to this, very little is known about the history of the building. However, the street along which the buildings are built has a rich history. The Scheveningseweg is a long, straight road constructed in 1653 connecting the old city centre and Scheveningen. This connection was important for transporting fish from the seaside to the city

centre. Next to that, this connection also facilitated the travel of city dwellers who wanted to spend a day at the Scheveningen. Before this road was constructed, the two areas were connected by pads going through the dunes. However, these pads were rough to poorly traversed, and the wind often flooded them with sand. In the nineteenth century, more roads were added, crossing through the Scheveningseweg and developing more neighbourhoods around this main street. Next to this, the fact that the Scheveningseweg was completely straight- which was odd for this time- made it relatively easy to build a tramline along this road (first a horse-drawn tram and currently a normal tramline). With time, the dunes disappeared and morphed into a more park-like landscape (e.g., the Scheveningse Bosjes, across the building along Scheveningseweg 64).
A party last bought the building in 2006 (Vastgoeddata, 2023).

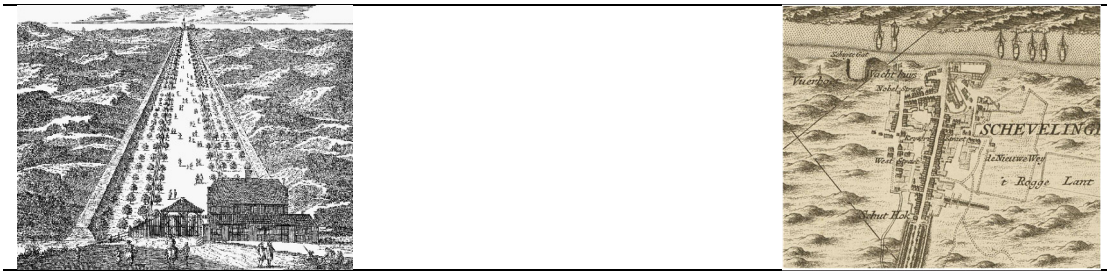


Figure 107: Different drawings of the Scheveningseweg starting with one by Cornelis Elandt around 1666 (picture 1) and one made in 1712 (picture 2)

Functional and cultural aspects

The building has five floors at its highest point. However, one of the wings has four floors (Vastgoeddata, 2023). Vertical extension is not possible, given the current roof construction. A part of the building sticks out taller than the rest. This smaller footprint does not allow for topping up.
Though most of the building is cladded in yellow bricks or white panels, the entrance of the U-shaped building is found in the middle and can be located by large glass panels. The logistics are arranged from this part of the building, and the wings on the left and right sides are accessed.
Below the building, there is a parking lot also. However, it is unclear how many spots it has.

Figure 108: Selection of pictures of the building along the Scheveningseweg 64 showing the entrance by car past the gate up to the ramp that goes to the underground car parking lot (pictures 1, 2 and 3) and the front side of the building (picture 4,5 and 6)(Vastgoeddata, 2023)

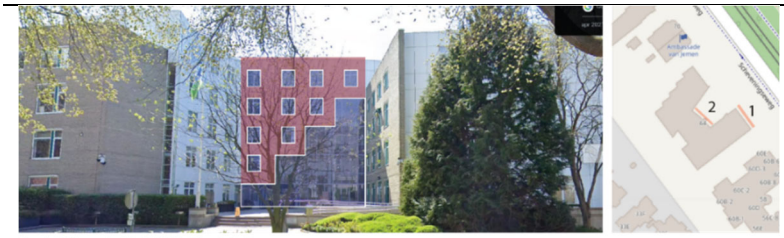
The building has a usable area of 5381m² and can theoretically produce a significant number of dwellings if transformed. The table below shows a simple calculation of the number of dwellings achievable after discounting 25% of the usable area for circulation. The number of dwellings is rounded off.

Usable area	Usable area minus 25% circulation space	Usable area minus 25% circulation space divided by 30m² dwellings	Usable area minus 25% circulation space divided by 50m² dwellings	Usable area minus 25% circulation space divided by 75m² dwellings
5381m²	4035,75m²	134,525 dwellings	80,715 dwellings	53,81 dwellings

As the building is still in use, it is presumed that the necessary periodic maintenance has taken place. Next to that, from the outside and at first glance, the building looks well-kept. It is also believed that a part of the building has been renovated already and has an energy label A+ (valid until 2032), whilst the other part has an energy label E (label for Scheveningseweg 62, which is valid until 2026) (Vastgoeddata, 2023). It is unclear why two energy labels have been appointed to the building.

Technical and legal aspects

The window pattern is regular across the whole façade and aligned with housing needs. However, the windows are relatively small compared to the amount of brick used.



Facade 1 | Approximately 55,10 % of facade is glass.

Facade 2 | Approximately 25% of facade is glass.

Figure 109: Rhythm of windows in the façade of Scheveningseweg 64

The zoning plan for the area where the building is located indicates that the ground is designated for 'Office' (Ruimtelijke Plannen, N.D.).

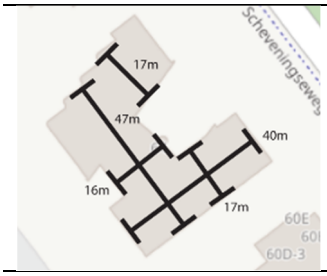


Figure 110: Rough measurements on edited map (Open Street Map, N.D.)

Figure 111: Aerial view of Scheveningseweg 64 (Google Earth, N.D.)

Figure 112: plot of Scheveningseweg 64 (Kadastrale kaart, N.D.)

Conclusion Scheveningseweg 64

The building looks well-kept and has a very straightforward layout consisting of a U-shape with an open space in the middle leading to the entrance of the building, and from there, the wings on the left and right can be accessed. Although the windows are small, the window placement is consistent

across all facades. The green environment and the fact that there is an open space in front of the building could be an opportunity to provide dwellings for the elderly.

Building 5 (Kerketuinenweg 2)

Built year: 1991
Usable area: 13565 m²
Energy label: D
Zoning plan: 'Business'
Listed monument: no

(Ruimtelijke Plannen, N.D.; Vastgoeddata, N.D.) *Figure 113: Kerketuinenweg 2 (Vastgoeddata, N.D.)*

History of building

The building along the Kerketuinenweg 2 was constructed in 1991 and is currently used by Allsafe Mini Opslag, a company offering short-term and long-term storage solutions for private and commercial parties. The company provides different storage solutions, including storage spaces for miscellaneous objects, storage spaces for motorized vehicles, storage spaces for tires, storage spaces for archives, mailbox rentals and storage spaces for web shops. The building is in a business park called Bedrijventerrein ZKD (Zichtenburg-Kerketuinen-Dekkershoek), where all the plots surrounding Kerketuinenweg 2 also have a business function.

A party last bought the building in 2016 (Vastgoeddata, 2023). Next to that, after 2015, it was renovated, and in 2018, the building was once more renovated (figure below).

Figure 114: The building had a different façade in 2015 (picture 1), which was altered by 2016 and once more by 2018 (picture 2) (Google Earth, N.D.)

Functional and cultural aspects

The building is one large closed box, with windows in one corner where the entrance of the building resides. The building has three floors (as can be seen above).
The building looks well maintained and is designed to attract attention (blue and yellow panelling reflecting the primary colours of the current company using the building) even though it is mostly closed off. The roof of the building is flat.

Figure 115: The main entrance of the building, which is the only part of the building with a significant amount of windows; the rest of the building is completely closed off and cladded with blue panelling(Vastgoeddata, 2023)

The building has a usable area of 13565m² and can theoretically produce a significant number of dwellings if transformed. The table below shows a simple calculation of the number of dwellings achievable after discounting 25% of the usable area for circulation. The number of dwellings is rounded off.

Usable area	Usable area minus 25% circulation space	Usable area minus 25% circulation space divided by 30m² dwellings	Usable area minus 25% circulation space divided by 50m² dwellings	Usable area minus 25% circulation space divided by 75m² dwellings
13565m²	10173,75m²	339,125 dwellings	203,475 dwellings	135,65 dwellings

Technical and legal aspects

The building has three floors, and presumably, it has lifts.

Given that the building was built to support storage activities, it has few windows (picture below). The only part of the building with windows is the corner where the entrance is also found. The other parts of the façade are almost entirely covered with blue sheeting. Thus, the dimensions of the building, in combination with the design of the façade, do not allow for sufficient daylight for the building to be transformed.

Next to that, the building is incredibly deep whilst simultaneously being very low (only two floors). These dimensions also do not align with the dimensions required for housing.

Facade 1 | Approximately 17.12 % of facade is glass.

Facade 2 | Approximately 26.15% of facade is glass.

Figure 116: Rhythm of windows in the façade of Kerketuinenweg 2 (own image)

The space next to the building, which has approximately 115 parking spots, is used as a parking lot. It is unclear if this parking lot is shared or not. However, this part of the plot is connected to the address.

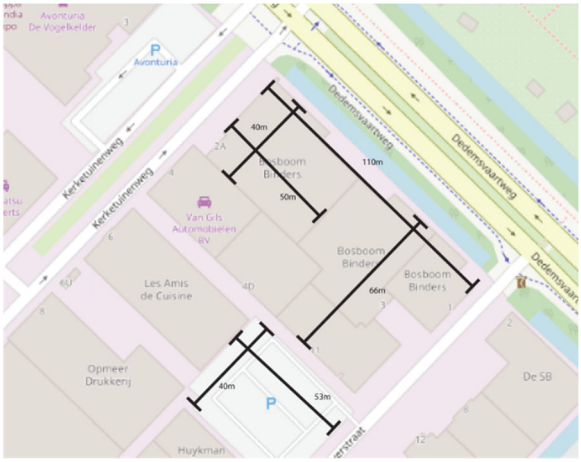


Figure 117: Plot of Kerketuinenweg 2 with rough measurements on the edited map from (Open Street Map, N.D.)

The zoning plan for the area where the building is located indicates that the ground is designated for Business. This refers to business activities, wholesale trade, storage and retail trade in passenger cars (Ruimtelijke Plannen, N.D.).

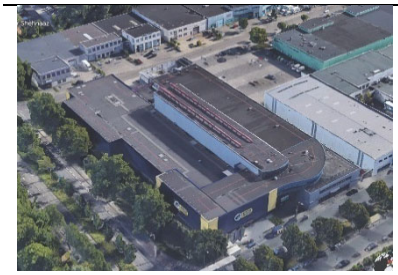


Figure 118: Aerial view of Kerketuinenweg 2(Google Earth, N.D.)

Figure 119: plot of Kerketuinenweg 2(Kadastrale kaart, N.D.)

Conclusion Kerketuinenweg 2

The building along Kerketuinenweg 2 has no potential to be transformed into housing. The building is functionally designed for a completely different purpose, which does not align with the dimensions required for housing. The building consists of a large closed-off box with windows on one of the corners. Other than that, the building has no architecturally exciting features.

Building 6 (Leggelostraat 85)

Built year: 1964
Usable area: 4500m²
Energy label: D
Zoning plan: 'Social - 2'
listed monument: no

(Ruimtelijke Plannen, N.D.; Vastgoeddata, N.D.)

Figure 120: Leggelostraat 85 (Google Earth, N.D.)

History of building

The office building along the Leggelostraat 85 was built in 1964 and is currently used for different mental health service providers (e.g., GGZ Parnassia Behandelcentrum). Other than this, very little is known about the history of the building. The building is not a listed monument.

Functional and cultural aspects

The building is shaped from above like the letter P and consists of different volumes, all of which have a different height and appearances. It also appears that some building parts were later added

to expand the building. To illustrate in picture number 3 below, a part of the building can be seen, which is split in two: a volume made from brick and a lower volume in front of it, which is made from glass, wood, and plaster material. The wooden part is most likely a common room for the current users. However, such spaces are not as attractive in buildings that need to be transformed. The difference in height of the different volumes also makes vertically extending the building complex. In the middle of the building, there is a small courtyard.

Figure 121: Selection of pictures of the building along the Leggelostraat 85, the front façade of the building, which has an L-shape (pictures 1, 2 and 3) and the back side (Google Earth, N.D.)

The building has a usable area of 4500m² and can theoretically produce a significant number of dwellings if transformed. The table below shows a simple calculation of the number of dwellings achievable after discounting 25% of the usable area for circulation. The number of dwellings is rounded off.

Usable area	Usable area minus 25% circulation space	Usable area minus 25% circulation space divided by 30m² dwellings	Usable area minus 25% circulation space divided by 50m² dwellings	Usable area minus 25% circulation space divided by 75m² dwellings
4500m²	3375m²	112,5 dwellings	67,5 dwellings	45 dwellings

Technical and legal aspects

Since the building is in use and rented out by a company, it is presumed that regular maintenance has taken place. The depths of the wings would allow for studios to be built connected through a corridor. Immediately in front of the building, there are five parking spots. However, parking spaces are along the three streets surrounding the building (Leggelostraat, Eeldeplatsoen, and Dedemsvaartweg).

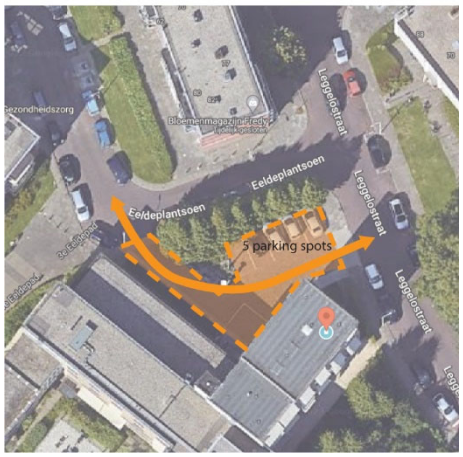


Figure 122: Plot of Leggelostraat 85 with rough measurements on an edited map (picture 1) and a picture depicting the parking situation on the site (Open Street Map, N.D.)

The zoning plan for the area where the building is located indicates that the ground is designated for 'Social - 2'.

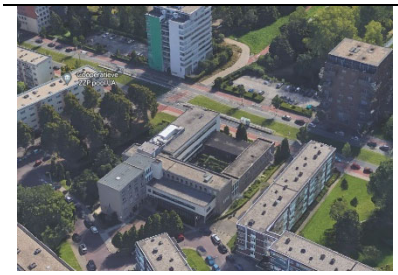


Figure 123: Aerial view of Leggelostraat 85 (Google Earth, N.D.)

Figure 124: plot of Leggelostraat 85 (Kadastrale kaart, N.D.)

Conclusion Leggelostraat 85

Given its location in a residential area, this building could well be transformed into housing. However, large volumes with different sizes and heights and different materials could pose a challenge.

Building 7 (Zonweg 33)

Built year: 1971
Usable area: 3513 m²
Energy label: D
Zoning plan: 'transformation area'
Listed monument: no

(Ruimtelijke Plannen, N.D.; Vastgoeddata, N.D.)

Figure 125: Zonweg 33 (Vastgoeddata, N.D.)

History of building

This building currently serves as an office space for BAM NBM Wegenbouw. Around the 1950s, an asphalt and concrete plant were built on the Zonweg 33. These plants were upgraded numerous times between the 1950s and the 1970s (e.g., a 140m crane track was built on the quay). In 1971, offices were built on the Zonweg, and in the 1990s, the NBM was taken over by BAM, which is still active on this plant (Stichting Haags Industrieel Erfgoed, N.D.-b). This building is not a listed monument. A party last bought the building in 2016 (Vastgoeddata, 2023).



Figure 126: Different pictures of the production centre behind the building along Zonweg 33 from 1960 (picture 1), 1965 (picture 2) and 2017 (picture 3)(Stichting Haags Industrieel Erfgoed, N.D.-b)

Functional and cultural aspects

The plot of the address is much larger than the footprint of the building only as it is connected to the industrial plant behind the building (see picture below showing kadaster chart). Thus, more could be built on the plot of land; however, given the nature of the activities currently on the premise, housing is unsuitable. Next to that, to redevelop the plot, the ground surrounding would have to be cleaned extensively to deal with the pollution caused by the asphalt and concrete factory. Area development is also necessary to introduce housing concerning the facilities needed on this street.



Figure 127: Zonweg 33 (1975) showing the office building on the right, aerial view of Zonweg 33 and plot of Zonweg 33 (Google Earth, N.D.; Kadastrale kaart, N.D.; Stichting Haags Industrieel Erfgoed, N.D.-b)

The building, with a usable area of 3513m², can accommodate a new function such as housing. The table below shows a simple calculation of the number of dwellings achievable after discounting 25% of the usable area for circulation. The number of dwellings is rounded off.

Usable area	Usable area minus 25% circulation space	Usable area minus 25% circulation space divided by 30m² dwellings	Usable area minus 25% circulation space divided by 50m² dwellings	Usable area minus 25% circulation space divided by 75m² dwellings
3513 m²	2634,75 m²	*88 dwellings*	*53 dwellings*	*35 dwellings*

Figure 128: Selection of pictures of the building along the Zonweg 33 showing the sides of the building, the entrance and the parking space in front of the building(Vastgoeddata, 2023)

Technical and legal aspects

Not much is known about the degree of maintenance of this building. However, the building looks well-kept. It is presumed that regular maintenance has taken place since the same company has used the building for years. Furthermore, the building has five floors and has one lift (Vastgoeddata, 2023). On the left of the building, there is an external emergency staircase. The five floors have good access to daylight through the long rows of windows on every floor.

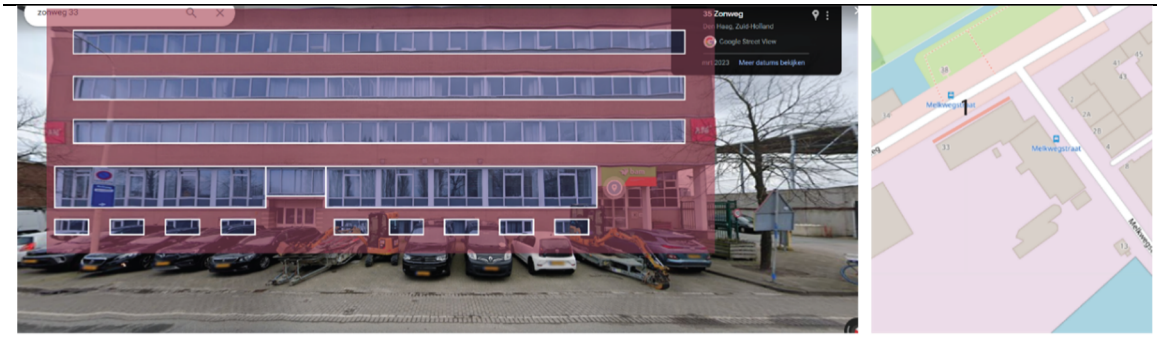


Figure 129: Rhythm of windows in the façade of Zonweg 33 (own image)

The space between the different floors is presumed to be less than 4 meters. This is deduced from the building being approximately 16,95m high, which leaves 3.39 meters over for every five floors (not considering the floor's depth) (AHN, N.D.).

Parking spots can be found in front of the building, on the side of the building, and the factory premises. Approximately 15 parking spots can be found in front of the building. Further along the street, there are also parking spots.

Figure 130: Plot of Zonweg 33 with parking facilities highlighted Open Street Map (N.D.)

The size of the building is highly suitable for the realization of dwellings, as seen below. The building has a predictable and straightforward grid and is not too deep.

Depth	Minus 2 meters of circulation	Depth of dwelling given corridor	30m²	50m²	75m²	100m²
A	B=A-2m	C=B/2	D=30/C	E=50/C	F=75/C	G=100/C
16 meters	14 meters	7m	4,29m	7,14m	10,71m	14,28m

Figure 131: Plot of Zonweg 33 with rough measurements on the edited map from Open Street Map (N.D.)

The zoning plan for the area where the building is located indicates that the ground is designated as a `transformation area`. This broad term allows the possibility to realize a wide variety of functions in this area, including housing, operating a hotel, providing (social) services, office spaces, holding events, operating a retail establishment, and much more.

Conclusion Zonweg 33

It does not make sense to transform this building into housing, given the activity that takes place in the backyard of the building. To consider this building for transformation, the conversation must include area development.

Building 8 (Binckhorstlaan 117)

Built year: 1984
Usable area: 22120 m²
Energy label: D
Zoning plan: 'transformation area'
Listed monument: no

(Ruimtelijke Plannen, N.D.; Vastgoeddata, N.D.) *Figure 132: Binckhorstlaan 117 (Vastgoeddata, N.D.)*

History of building

The building along the Binckhorstlaan 117 was built in 1984 and is not a listed monument. Next to this, very little is known about the building's history. The building is currently in use, and several companies rent office spaces. Two addresses are registered in this building: Binckhorstlaan 117 and Binckhorstlaan 119-1. According to Vastgoeddata (2023), the building was bought in 2016 by an investment company called Around Town, which sold the building in 2022 to a developer called Vorm.

Functional and cultural aspects

The building seen from above consists of a horizontal volume which interconnects three volumes perpendicularly. This structure is repeated across all seven floors of the building. On top of the building are three smaller volumes which poke out, making extending the building vertically impossible.

The design of the building is making the building appear very massive and unattractive for housing.

Figure 133: Selection of pictures of the building along the Binckhorstlaan 117 showing sides of the building (pictures 1 and 2), the front of the building (picture 3) and the other side of the building where the entrance to the parking areas are (pictures 4,5 and 6)(Vastgoeddata, 2023)

The building, with a usable area of 22120m², can accommodate a new function such as housing. The table below shows a simple calculation of the number of dwellings achievable after discounting 25% of the usable area for circulation. The number of dwellings is rounded off.

Usable area	Usable area minus 25% circulation space	Usable area minus 25% circulation space divided by 30m² dwellings	Usable area minus 25% circulation space divided by 50m² dwellings	Usable area minus 25% circulation space divided by 75m² dwellings
22120 m²	16590 m²	553 dwellings	331,8 dwellings	221,2 dwellings

The appearance of the building is not particularly attractive for housing and looks unkept.

On the premises, there is a parking lot which has, according to Vastgoeddata (2023), 99 parking spots, which are not shared with any other building. Cars are parked in different parts of the plot; behind the building is space in which cars are parked, and in front of the building.

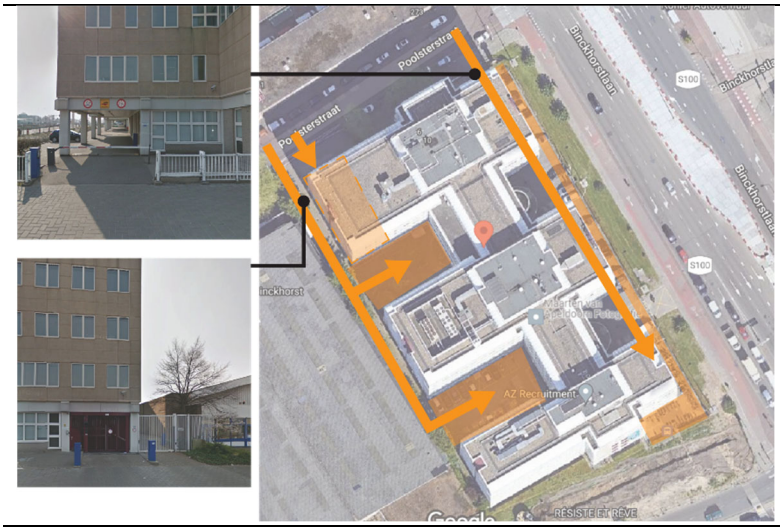
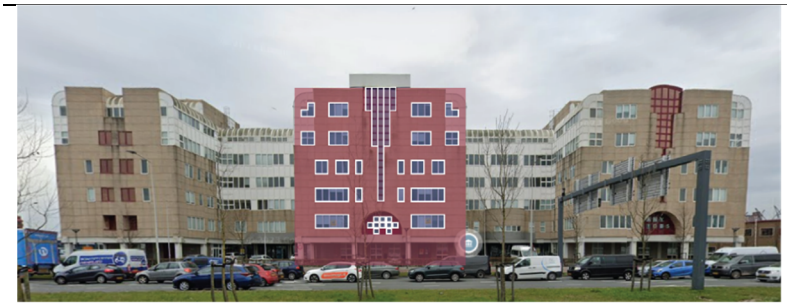


Figure 134: Parking situation in the building (Google Earth, N.D.)

Technical and legal aspects

The grid on which the building is built is approximately 7 meters wide.
Next to that, the façade does not have a lot of window surface. In some parts, it has more than others.



Facade 1 | Approximately 22.40 % of facade is glass.

Facade 2 | Approximately 30.04 % of facade is glass.

Figure 135: Rhythm of windows in the façade of Binckhorstlaan 117 (own image)

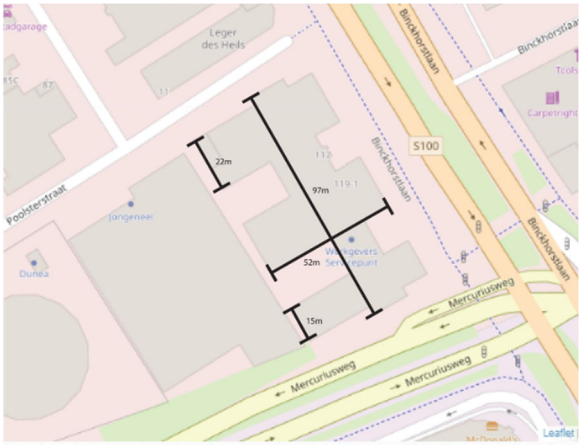


Figure 136: Plot of Binckhorstlaan 117 with rough measurements on the edited map from Open Street Map (N.D.)

The zoning plan for the area where the building is located indicates that the ground is designated as a 'transformation area'. This broad term allows the possibility to realize a wide variety of functions in this area, including housing, operating a hotel, providing (social) services, office spaces, holding events, operating a retail establishment, and much more.

Figure 137: Aerial view of Binckhorstlaan 117 (Google Earth, N.D.)

Figure 138: plot of Binckhorstlaan 117 (Kadastrale kaart, N.D.)

Conclusion Binckhorstlaan 117

The exterior appearance of the building would have to be upgraded to fit the target group's expectations. The building is, however, of sufficient size and has a structure that could easily be reused. The number of windows would have to be looked at to ensure that the dwellings have sufficient daylight.

Building 9 (Kerklaan 195)

Built year: 1912
Usable area: 3125 m²
Energy label: Unknown
Zoning plan: 'Business'
Listed monument: no

(Ruimtelijke Plannen, N.D.; Vastgoeddata, N.D.) *Figure 139: Kerklaan 195 (Vastgoeddata, N.D.)*

History of building

Not much can be found about the history of the building along the Kerklaan 195. A selection of the buildings in the vicinity date from the pre-war era and some from the post-war era. This resulted in many two-storey buildings with pitched roofs (pre-war) (Dienst DSO, 2000). The building in question was built in 1912.

Figure 140: picture of different sides of the façade of the building along Kerklaan 195 showing the side of the building and the narrow street which gives access to the back of the building (picture 1), the corner of the building (picture 2) the front entrance and the main facade (pictures 3 and 4) (Google Earth, N.D.)

Functional and cultural aspects

The building has two floors and zero lifts, which is unnecessary for such a low building. The roof of the building is flat, and given the year of construction and the look of the building, it is presumed that this construction is light. Extending the building is most likely not possible, given the light construction of the roof and the lack of space on the rest of the plot. Next to that, all buildings in the vicinity are low (approximately two storeys).

The building has a distinctive and attractive appearance, given that it is made of brown bricks and has large, tall windows.

Behind the building, there is a little open area which different people use to access the back side of the buildings, and cars are also parked here. This area is accessed through a small street directly connected to the building. This road can be seen in the first picture in the row of pictures above. There are parking spots in front of the building and on the street.

The building, with a usable area of 3125m², has enough capacity to accommodate a new function such as housing. The table below shows a simple calculation of the number of dwellings achievable after discounting 25% of the usable area for circulation. The number of dwellings is rounded off.

Usable area	Usable area minus 25% circulation space	Usable area minus 25% circulation space divided by 30m² dwellings	Usable area minus 25% circulation space divided by 50m² dwellings	Usable area minus 25% circulation space divided by 75m² dwellings
3125 m²	2343,75 m²	78,125 dwellings	46,875 dwellings	31,25 dwellings

It is unclear what the condition of the building maintenance is; however, from the pictures and Google images, it does not look like the nicest building.

Technical and legal aspects

Since this building was built in 1912, it is also presumed that it might not have been upgraded yet with features like double glazing and sufficient insulation.

Although the two floors are equipped with large windows, the building is deep, making sufficient daylight impossible in its current state. Thus, housing can only be introduced if a solution is considered, such as cutting out a block in the middle of the building to let daylight through.

Figure 141: Rhythm of windows in the façade of Kerklaan 195 (own image)

The building has an external escape staircase leading to the inner yard behind the building (image below). Thus, the building has two access points: the main entrance and the doors connecting to the escape staircase leading to the inner yard.

The two floors are high. The height of the building is 15,21, which, when divided by two floors, leaves 7.605 meters per floor. The height of the floor and roof is not discounted; however, compared to other buildings, this building has relatively high rooms.

Figure 142: External staircase leading to the inner yard of the building along the Kerklaan 195 Open Street Map (N.D.)

The building is very deep (approximately 32 m), and though it has a very clear grid of windows, this depth is complex for realizing small dwellings as this would result in very long but narrow studios. Long studios are not always attractive since there will always be a part of the dwelling which does not receive sufficient daylight. Next, if apartments are considered, the same problem will be encountered since certain rooms in apartments need access to natural daylight (e.g., bedrooms). This would be possible if a volume is removed in the middle of the building. However, the building would have to be able to deal with that structurally.

Depth	Minus 2 meters of circulation	Depth of dwelling given corridor	30m²	50m²	75m²	100m²
A	B=A-2m	C=B/2	D=30/C	E=50/C	F=75/C	G=100/C
32m	30m	15	2	3,3	5	6,6

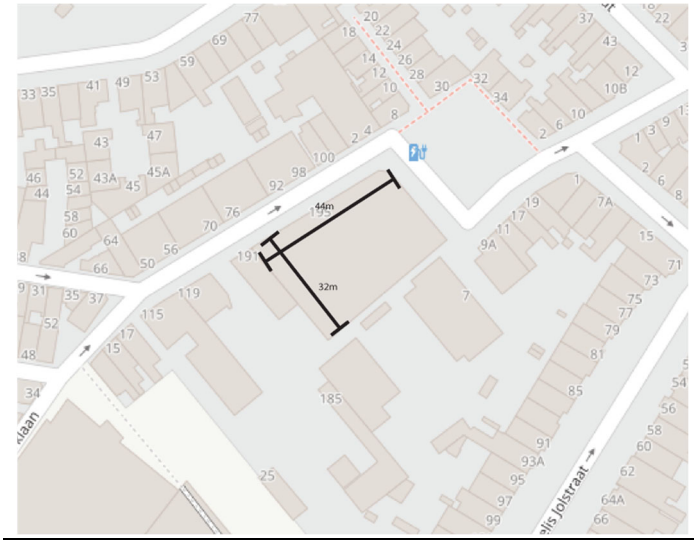


Figure 143: Plot of Kerklaan 195 with rough measurements on the edited map from Open Street Map (N.D.)

The zoning plan for the area where the building is located indicates that the ground is designated for 'Business'.

Figure 144: Aerial view of Kerklaan 195 (Google Earth, N.D.)

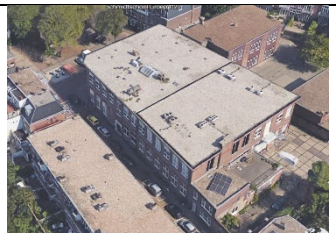


Figure 145: plot of Kerklaan 195 (Kadastrale kaart, N.D.)

Conclusion Kerklaan 195

The rest of the buildings in the vicinity are dwellings and some educational buildings, which are approximately two storeys high. Thus, the function of housing is appropriate, given the surroundings. The external features of the building are also attractive (deep red brick with tall windows). However, housing does not automatically come to mind when looking at this building due to its depth and the complications that it would bring about when designing a layout, especially if the developer might be interested in realizing smaller units.

Building 10 (Saturnusstraat 9)

Built year: 2008
Usable area: 13282m²
Energy label: Unknown
Zoning plan: 'transformation area'
Listed monument: no

(Ruimtelijke Plannen, N.D.; Vastgoeddata, N.D.)

Figure 146: Saturnusstraat 9 (Vastgoeddata, N.D.)

History of building

The building along the Saturnusstraat 9 was built in 2008 and is not a listed monument. Next to this, very little is known about the building's history. The building is currently in use, and several companies rent office spaces. The building was last bought in 2017 by Van de Valk Investments

(VDVI) from De Heer M.D.M. van Oosterhout and is currently managed by Motus (Vastgoeddata, 2023).

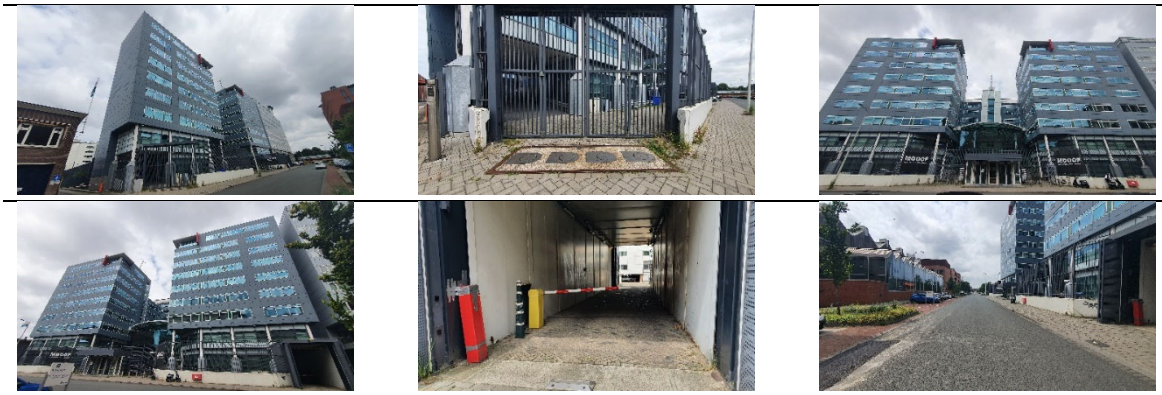


Figure 147: Selection of pictures of the building along the Saturnusstraat 9 showing different parts of the façade of the building, including the entrance for cars (Vastgoeddata, 2023)

Functional and cultural aspects

The building has a clear structure consisting of a lower part in the middle where the entrance is located. This lower structure is embraced on three sides by a U-shaped office space. The front of the building has nine floors, whilst the back is lower and has seven floors with an oval structure sticking out on top, forming the 8th floor. Furthermore, the building has three lifts (Vastgoeddata, 2023).

Given the built year, it is presumed that the circulation of the building can easily be reused for another function, such as housing. Next to that, the façade elements could most likely also be reused. However, the building aesthetics are more in line with that of an office building compared to the appearance of an apartment building.

The building, with a usable area of 1328m², has enough capacity to accommodate a new function such as housing. The table below shows a simple calculation of the number of dwellings achievable after discounting 25% of the usable area for circulation. The number of dwellings is rounded off.

Usable area	Usable area minus 25% circulation space	Usable area minus 25% circulation space divided by 30m² dwellings	Usable area minus 25% circulation space divided by 50m² dwellings	Usable area minus 25% circulation space divided by 75m² dwellings
13282m²	9961,5m²	332,05 dwellings	199,23 dwellings	132,82 dwellings

Technical and legal aspects

It is unclear what the level of maintenance of this building is, but because it is still in use and the building is relatively young, it is presumed that regular maintenance has taken place.

The height between the floors is presumed to be less than 4 meters. The building is at its highest point, approximately 33 meters high, divided by nine floors equals 3.67 meters (thickness of the floors is not discounted) (AHN, N.D.).

The building seems to have a grid approximately 6 meters wide (24 meters divided by 4 is 6 meters wide).

Depth	Minus 2 meters of circulation	Depth of dwelling	30m²	50m²	75m²	100m²

		given corridor				
A	B=A-2m	C=B/2	D=30/C	E=50/C	F=75/C	G=100/C
15	13	6,5	4,6	7,70	11,54	15,38

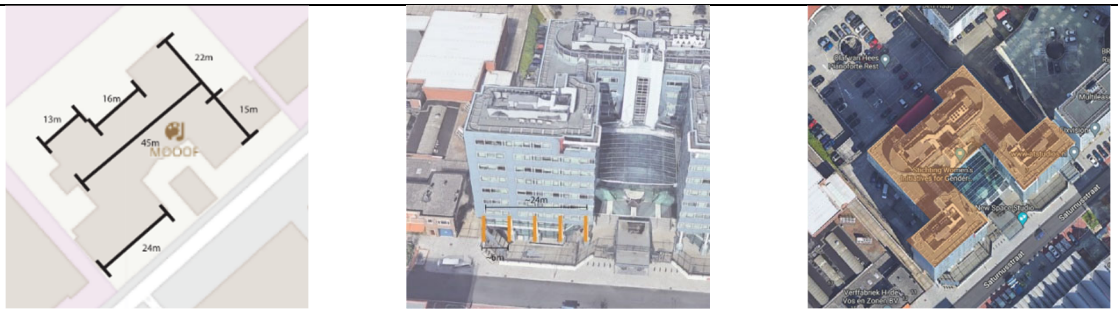


Figure 148: Plot of Saturnusstraat 9 with rough measurements, a picture showing the grid in front of the building and an outline of the U-shaped office building, which embraces the entrance of the building in the middle (Open Street Map, N.D.)

Currently, the zoning plan for the area where the building is located indicates that the ground is designated for a 'transformation area'. This broad term allows the possibility to realize a wide variety of functions in this area, including housing, operating a hotel, providing (social) services, office spaces, holding events, operating a retail establishment, and much more.

Figure 149: Aerial view of Saturnusstraat 9 and plot of Saturnusstraat 9(Google Earth, N.D.; Kadastrale kaart, N.D.)

Conclusion Saturnusstraat 9

This building is attractive because its age means that the inner circulation of the building can easily be reused for another function, such as housing. Next to that, the age of the building would also mean that different elements of the building could most likely easily be reused. However, the appearance of the building is not attractive for housing (cold appearance).

Building 11 (Bezuidenhoutseweg 60)

Built year: 1972
Usable area: 7965 m²
Energy label: Unknown
Zoning plan: 'Office'
Listed monument: no

(Ruimtelijke Plannen, N.D.; Vastgoeddata, N.D.) *Figure 150: Bezuidenhoutseweg 60 (Vastgoeddata, N.D.)*

History of building

The building along the Bezuidenhoutseweg 60 is the office building of the Sociaal-Economische Raad (SER). SER- called the Social and Economic Council in English- is an advisory board established in 1950 geared at providing guidance for the government and parliament on socio-economic policy on

a wide variety of topics (e.g., education, the labour market, and pensions). Next to SER, there are also other organisations established in the building. The building was delivered in 1972 and is not a listed monument. Parking is arranged on the plot of the building, and a gate currently regulates access. However, the Qpark New Babylon (at the Central Station) is close to the building.

Figure 151: Bezuidenhoutseweg 60 which was built behind the old office building for the SER which was demolished afterwards (Mieremet, 1971)

Functional and cultural aspects

The building can be divided into two volumes: a tower with eight floors and a lower volume where the entrance to the building is also situated with three floors. The building has a total of 4 lifts and 56 parking spots, six of which have charging ports (Vastgoeddata, 2023). On top of the second floor of the lower volume, there is a volume that sticks out and has a slanted roof (presumably a conference room of some sort?) (It can be seen sticking out on the second figure below).

Figure 152: Pictures of the building along Bezuidenhoutseweg 60 (Vastgoeddata, 2023)

The building, with a usable area of 7965m², has enough capacity to accommodate a new function such as housing. The table below shows a simple calculation of the number of dwellings achievable after discounting 25% of the usable area for circulation. The number of dwellings is rounded off.

Usable area	Usable area minus 25% circulation space	Usable area minus 25% circulation space divided by 30m² dwellings	Usable area minus 25% circulation space divided by 50m² dwellings	Usable area minus 25% circulation space divided by 75m² dwellings
7965m²	5973,75m²	199,125 dwellings	119,475 dwellings	79,65 dwellings

Technical and legal aspects

The higher volume has a very regular grid of windows on all the facades (figure below). However, the ratio of windows to solid materials is not optimal as the windows are small.

Figure 153: Rhythm of windows in the façade of Bezuidenhoutseweg 60 (own image)

Figure 154: Rough measurements on edited map and parking spaces in front and on the side of the building (approx. 56 parking spots (Open Street Map, N.D.)

The zoning plan for the area where the building is located indicates that the ground is designated for 'Office'. Grounds designated as 'Office' are suitable for office buildings with childcare services and parking facilities.

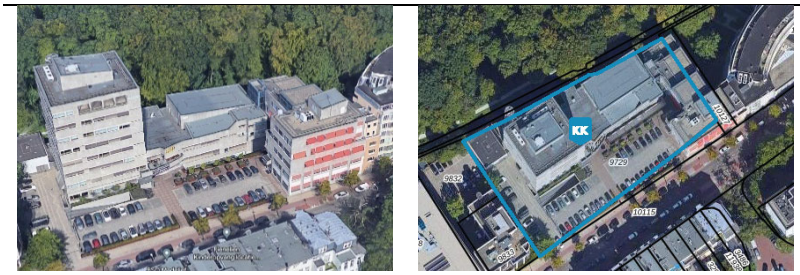


Figure 155: Aerial view of Bezuidenhoutseweg 60 and plot of Bezuidenhoutseweg 60(Google Earth, N.D.; Kadastrale kaart, N.D.)

Conclusion Bezuidenhoutseweg 60

The building feels like a bunker due to the tower's small windows and the smaller structure's deepness on the side. However, the presence of parking spaces in front is nice.

Building 12 (Bordewijklaan 15)

Built year: 1994
Usable area: 4209m²
Energy label: Unknown
Zoning plan: 'Office'
Listed monument: no

(Ruimtelijke Plannen, N.D.; Vastgoeddata, N.D.)

Figure 156: Bordewijklaan 15 (Vastgoeddata, N.D.)

History of building

The building along the Bordewijklaan 15 is the office building of the Benelux-Bureau voor de Intellectuele Eigendom (BOIP). BOIP is the official body in Benelux that registers designs, trademarks, and drawings.

This building is not a listed monument. However, the building was designed by Herman Hertzberger, who grew to be one of the most well-known architects in the Netherlands because of his contribution to the structuralist movement in Dutch architecture. He is famous for designing the

building for Centraal Beheer in Apeldoorn (1967 – 1972). He also designed the office building for the Ministry of Social Affairs and Employment in The Hague (1979-1990) in structural style.
The building along the Bordewijklaan 15 shows a shift in style as it is not designed in a structuralist style like the office building for the Ministry of Social Affairs and Employment in The Hague. The office building consists of four wings, which are connected by the presence of two towers. On top of the building sits a circular meeting room. The facades are clad in grey natural stone combined with clean-lined windows.
It is unclear who the owner of the building is now. However, Jovi Investments currently manages the building (Vastgoeddata, 2023).


Figure 157: Building for Centraal Beheer in Apeldoorn (left) and office building for Ministry of Social Affairs and Employment in The Hague (right) designed by Herman Hertzberger (TCN, N.D.; Jurriaan Brobbel, N.D.)

Functional and cultural aspects

Extension on top of the building could be possible. However, this would ruin the design of the building as intended by the original architect and given the large building size, it might not be relevant. Furthermore, an extension on the plot of land surrounding the building is impossible.
Next, this building looks like an office building, which could decrease its attractiveness to target groups.



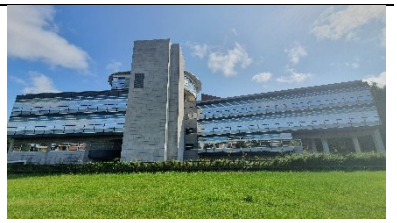


Figure 158: Pictures of the building along the Bordewijklaan 15 showing the driveway to enter the underground parking lot (picture 1), the left side of the building (picture 2), the front side of the building (picture 3), the entrance to the building (picture 4), the right side of the building (picture 5) (Vastgoeddata, 2023)

The building, with a usable area of 4209m², has enough capacity to accommodate a new function such as housing. The table below shows a simple calculation of the number of dwellings achievable after discounting 25% of the usable area for circulation. The number of dwellings is rounded off.

Usable area	Usable area minus 25% circulation space	Usable area minus 25% circulation space divided by 30m² dwellings	Usable area minus 25% circulation space divided by 50m² dwellings	Usable area minus 25% circulation space divided by 75m² dwellings

4209m²	3156,75m²	105,225 dwellings	63,135 dwellings	42,09 dwellings	

The building has its parking lot below the ground. The parking has two access points as the road connecting to it is one-way; on the right side of the building, there is an entrance, and on the left side, there is an exit. It is unclear how many parking spots there are under the building.

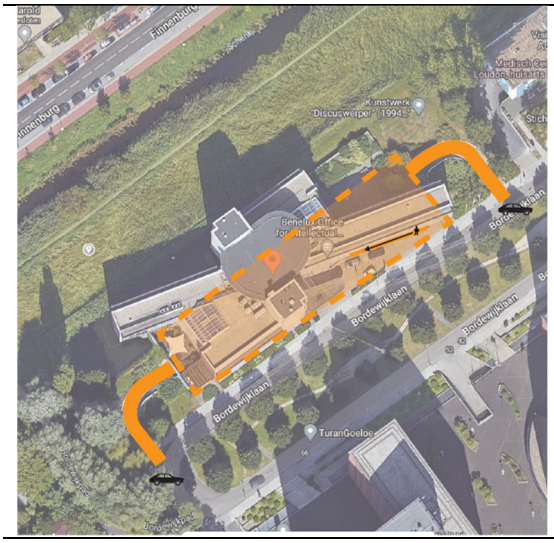


Figure 159: Entrance and exit to the underground parking lot (Google Earth, N.D.)

Technical and legal aspects

The main volumes of the building have four floors each, and there are two sets of lifts in the building (Vastgoeddata, 2023)

As the same party has used the building since it was constructed, it is assumed that it has received regular maintenance to ensure that the company using it can use it. The exterior of the building looks well-kept.

The length of the building would result in a lot of square meters being lost in circulation space.

Depth	Minus 2 meters of circulation	Depth of dwelling given corridor	30m²	50m²	75m²	100m²
A	B=A-2m	C=B/2	D=30/B	E=50/B	F=75/B	G=100/B
8	6	*Irrelevant*	5	8,33	12,5	16,66

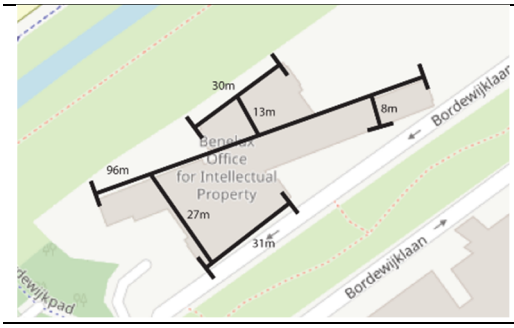


Figure 160: Plot of Bordewijklaan 15 with rough measurements on the edited map from Open Street Map (N.D.)

The zoning plan for the area where the building is located indicates that the ground is designated for 'Office'. Grounds designated as 'Office' are suitable for office buildings, parking facilities and hospitality services.

Figure 161: Aerial view of Bordewijklaan 15 (Google Earth, N.D.)

Figure 162: plot of Bordewijklaan 15 (Kadastrale kaart, N.D.)

Conclusion Bordewijklaan 15

What makes this building attractive initially is the fact that it is only a 10-minute walk from the Mariahoeve Station. The building is also massive; however, the shape of the building is not as straightforward for the realization of dwellings. Specifically, the length of the building could mean that a lot of square meters will be lost to access routes to get to the dwellings.

Building 13 (Waldorpstraat 80)

Built year: 2005
sable area: 10570m²
Energy label: Unknown
Zoning plan: 'Mixed-4'
municipal monument: no

(Ruimtelijke Plannen, N.D.; Vastgoeddata, N.D.)

Figure 163: Waldorpstraat 80 (Vastgoeddata, N.D.)

History of building

The building along the Waldorpstraat 80 was built in 2005 and provides office spaces for several companies. This is not a listed monument; very little is known about its history.
The building was last bought by a party in 2017 by Ter Brunke Vastgoedontwikkeling from Wealthcap and is currently rented out by JLL (Vastgoeddata, 2023).

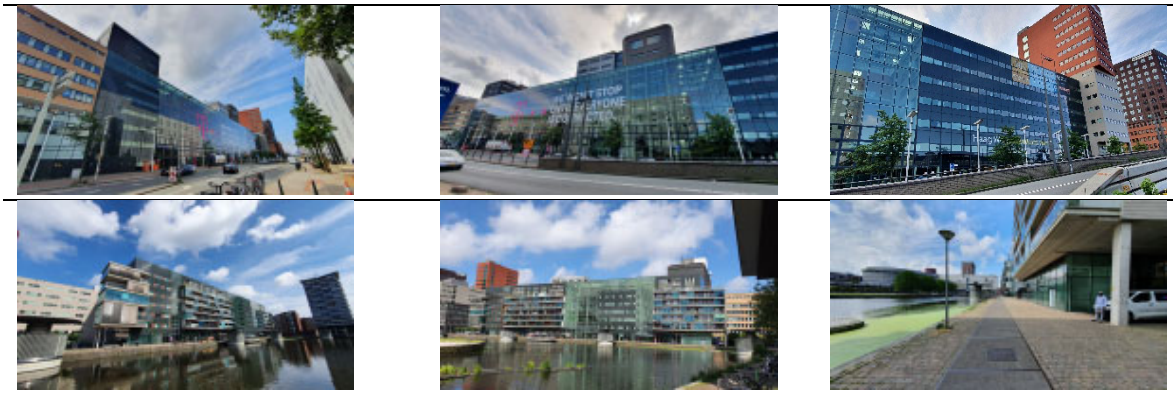


Figure 164: selection of pictures of the building along the Waldorpstraat 80 showing the front side of the building facing the Hague HS station (pictures 1,2 and 3) and the back side of the building facing the Haagse Hogeschool and the Leeghwaterkade (pictures 4,5 and 6) (Vastgoeddata, 2023)

Functional and cultural aspects

The building has nine floors, and according to Vastgoeddata (2023), the building has two sets of lifts. This office complex comprises numerous buildings connected by a glass box built around them. This collection of buildings can be best observed from above.

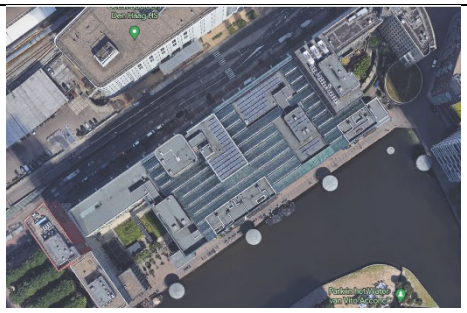


Figure 165: Building seen from above to show the separate buildings poking out of the glass box built around the premise (Google Earth, N.D.)

The building, with a usable area of 10570m², has enough capacity to accommodate a new function such as housing. The table below shows a simple calculation of the number of dwellings achievable after discounting 25% of the usable area for circulation. The number of dwellings is rounded off.

Usable area	Usable area minus 25% circulation space	Usable area minus 25% circulation space divided by 30m² dwellings	Usable area minus 25% circulation space divided by 50m² dwellings	Usable area minus 25% circulation space divided by 75m² dwellings
10570m²	7927,5m²	264,25 dwellings	158,55 dwellings	105,7 dwellings

The building is currently rented out to several companies and is in use. Therefore, it is assumed that the necessary regular maintenance has occurred. Other than that, the building looks well-kept.

Technical and legal aspects

The building is quite deep, which would make the provision of sufficient daylight difficult.
The building is not designed in a way conducive to housing, as there are a lot of large open rooms. If transformed, these areas will still have to be heated, for example, which would increase the service costs for users.

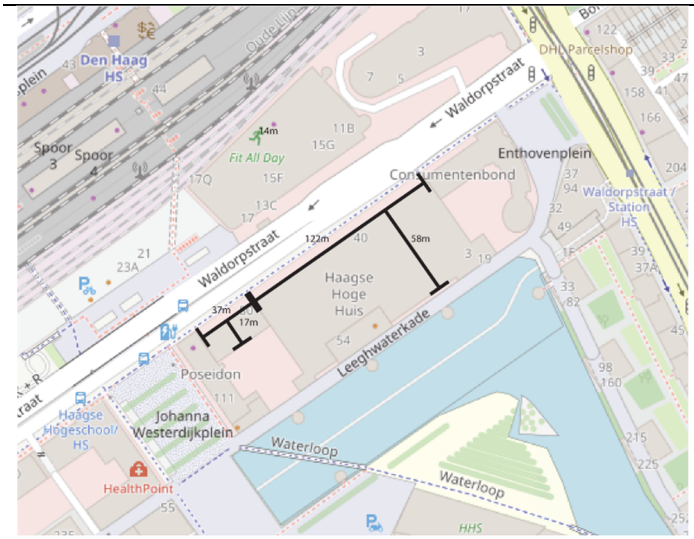


Figure 166: Plot of Waldorpstraat 80 with rough measurements on the edited map from Open Street Map (N.D.)

The zoning plan for the area where the building is located indicates that the ground is designated for 'Mixed-4'. This refers to a mix of functions, including offices, housing, retail and hospitality, provision of services and education. The zoning plan also gives direction on the location of these

functions in this building block (e.g., housing is allowed to be realized but exclusively on the upper floors and exclusively on the Leeghwaterkade).

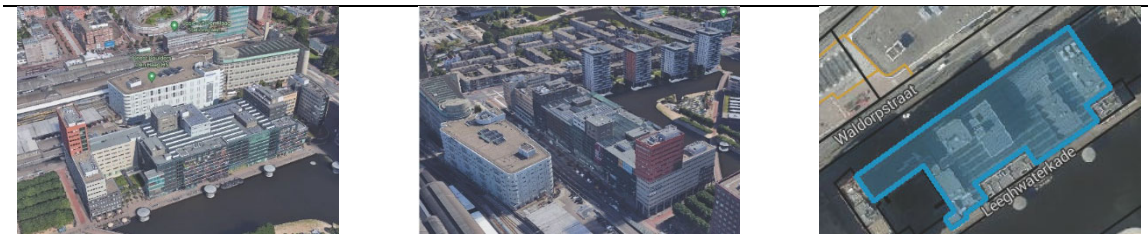


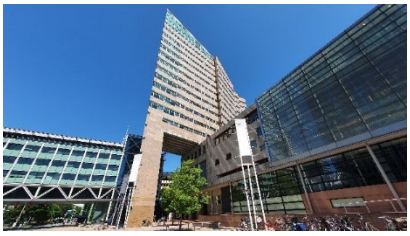
Figure 167: Aerial view of Waldorpstraat 80 and plot of Waldorpstraat 80 (Google Earth, N.D.; Kadastrale kaart, N.D.)

Conclusion Waldorpstraat 80

This type of building is not easily transformed into housing; the building itself is deep, threatening daylight. Next to that, the building has a ton of wasted square meters due to the large open spaces created internally, which are attractive for office buildings but not for housing.

Building 14 (Prins Clauslaan 20)

Built year: 1957
Usable area: 16952m²
Energy label: Unknown
Zoning plan: 'Office-1'
Listed monument: no



(Ruimtelijke Plannen, N.D.; Vastgoeddata, N.D.) *Figure 168: Prins Clauslaan 20 (Vastgoeddata, N.D.)*

History of building

The Prins Clauslaan 20 building is a tower consisting of 19 floors, three units for retail and hospitality on the side of the Theresiastraat. The building has approximately 45 parking spots. The Central Government Real Estate Agency bought the building in 2020 from LaSalle Investment Management. Thus, the Central Government Real Estate Agency is the sole owner of the building along the Prins Clauslaan 20, the original Peace of Justice building (Prins Clauslaan 60), and the two bridge buildings across the A12. The building has been in use by the Palace of Justice since its completion. Furthermore, the building has an A energy label and is partly connected to the original Palace of Justice next to it (Huisman, 2020).

The Palace of Justice in The Hague consists of two buildings connected. The lower building is the old Palace of Justice which was first built in the 1970s by the design of the architect Frank Sevenhuijsen. When the building was being built, it met the demands of the time regarding the facilities and rooms provided. However, as time passed, the number of court cases and the size of the judicial organization increased, leading to a lack of space. Next to that, the building had become outdated, which led to the decision to renovate it and build a new building next to it. The building was renovated and expanded in the nineties by the design of architect Niek van Vugt, during which a new ground floor was added in front of the building, as well as the office tower in question (Prins Clauslaan 20). Below, a figure shows the original building and, next to it, the parts added after the expansion in the nineties (De Rechtspraak, N.D.; Sebregts, N.D.).

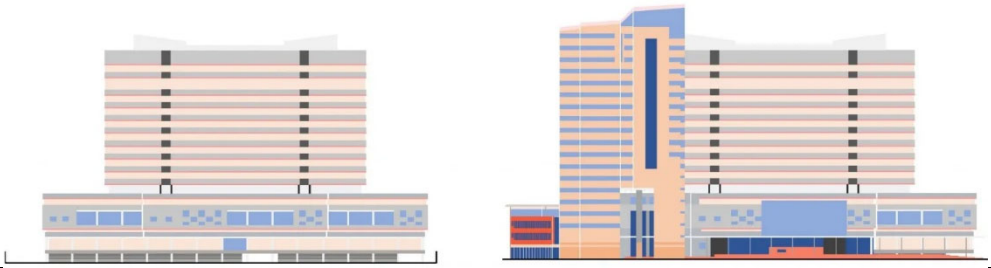


Figure 169: Front view of the Palace of Justice after being delivered in 1973 (left picture) and the front view of the building after being renovated and expanded with a new ground floor and an office tower in the nineties (right picture)(Sebregts, N.D.)

Functional and cultural aspects

The façade is cladded in pink-beige Brazilian granite. The office tower is 70 meters high and topped off with a sloped roof, adding to The Hague's skyline. Extending on top is currently impossible, given that the roof is slanted.

Currently, there are plans to renovate the old part of the building (referred to online as P1) and the office tower later added (referred to as P2). The renovation is geared towards modernizing the courtrooms and upgrading the functionality of the office spaces and work areas. Next, different building parts will be connected into one large complex, and the building will be upgraded regarding sustainability. The aim is to renovate the building to the level of new building.

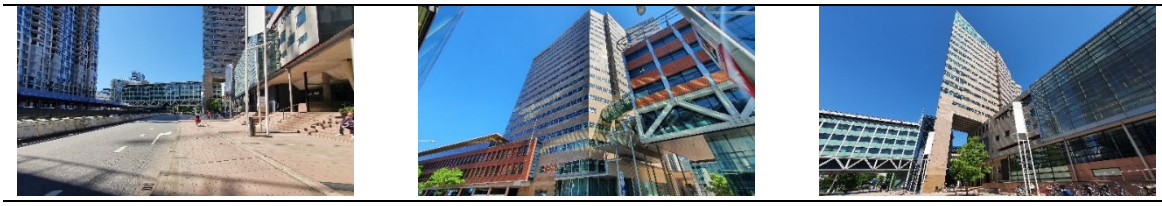


Figure 170: Selection of pictures of the building along the Prins Clauslaan 20 showing the entrance and the front of the building (Vastgoeddata, 2023)

The building has a usable area of 16952m² and can theoretically produce a significant number of dwellings if transformed. The table below shows a simple calculation of the number of dwellings achievable after discounting 25% of the usable area for circulation. The number of dwellings is rounded off.

Usable area	Usable area minus 25% circulation space	Usable area minus 25% circulation space divided by 30m² dwellings	Usable area minus 25% circulation space divided by 50m² dwellings	Usable area minus 25% circulation space divided by 75m² dwellings
16952m²	12714 m²	423,8 dwellings	254,28 dwellings	169,52 dwellings

Figure 171: Selection of pictures of the building along the Prins Clauslaan 20 showing the façade (Helix Advies, N.D.; Sebregts, N.D.)

Technical and legal aspects

The building has 19 floors, and according to Vastgoeddata (2023), it has six lifts. Next, the building has 42 parking spots available for its users.

The zoning plan for the area where the building is located indicates that the ground is designated for 'Office-1'. This refers to buildings which are designated for office.

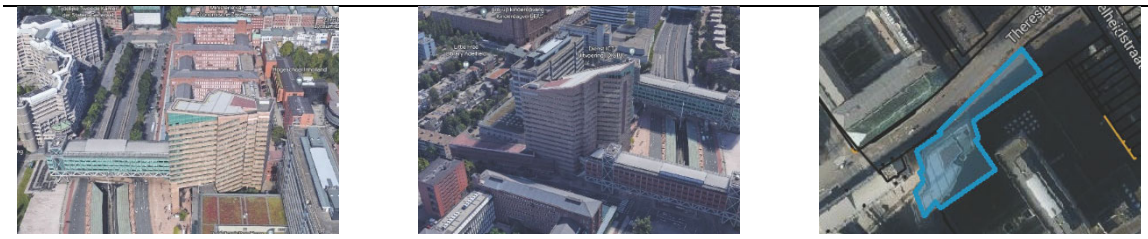


Figure 172: Aerial view of Prins Clauslaan 20 and plot of Prins Clauslaan 20 (Google Earth, N.D.; Kadastrale kaart, N.D.)

Conclusion Prins Clauslaan 20

This building is unsuitable and is being renovated to prolong its use as the Court of Justice. This is a vital function for the city of The Hague, and the municipality would want to have all the organizations for this function in one building. Thus, there is no reason to transform a part of the building into another function. Especially given the fact that the building is currently being renovated.

Building 15 (Koningskade 40)

Built year: 1994
Usable area: 3741m²
Energy label: Unknown
Zoning plan: 'Office-1'
Listed monument: no

(Ruimtelijke Plannen, N.D.; Vastgoeddata, N.D.) *Figure 173: Koningskade 40 (Vastgoeddata, N.D.)*

History of building

The building along the Koningskade 40 serves as the office space for Unie van Waterschappen, the association of the Dutch water boards responsible for managing flood defences, wastewater treatment and regional water management. Next to Unie van Waterschappen, other foundations geared towards water management are registered at this address, such as the NWB Fonds and the Schilthuisfonds. This building was built in 1994, making it 29 years old.

A part of the plot is also designated as housing, though those dwellings have different addresses assigned to them (Nassau Odijckstraat 2 A t/m 2 C). The entrance to these dwellings is next to the entrance to the parking lot. The building has its parking lot, and although it is unclear how many parking spots it has, it is suspected that it is a relatively small parking garage as one of the organisations situated in the building mentions on their website that visitors must inform them ahead of time so they can reserve a parking space for them.

A party last bought the building in 2001 (Vastgoeddata, 2023).



Figure 174: selection of pictures of building along the Koningskade 40 showing the entrance (picture 1), the front of the building (pictures 2 and 3), the side of the building providing entrance to the parking lot and the three dwellings registered on the same plot (picture 4), the entrance to the parking lot (picture 5) and the back of the building showing the windows of the three dwellings registered on the same plot (picture 6)(Vastgoeddata, 2023)

Functional and cultural aspects

The building has five floors, and although the grid of the windows in the façade is similar on most floors, the façades of the different floors are not entirely flushed in line with one another and differ in building materials. The plinth of the building is made from natural stone. The façades of the second and third floors relate to one another and have the same design, which is made of red bricks. Although the facade on the fourth floor is also made of red bricks, the rhythm of the windows on the fourth floor is different, giving the façade a different appearance once more. The façade of the fifth floor is made entirely out of glass and is not in line with that of the fourth floor but is pushed back a bit.

Figure 175: Picture of the façade (Google Earth, N.D.)

Figure 176: Rhythm of windows in the façade of Koningskade 40 (own image)

The building, with a usable area of 3.741m², has enough capacity to accommodate a new function such as housing. The table below shows a simple calculation of the number of dwellings achievable after discounting 25% of the usable area for circulation. The number of dwellings is rounded off.

Usable area	Usable area minus 25% circulation space	Usable area minus 25% circulation space divided by 30m² dwellings	Usable area minus 25% circulation space divided by 50m² dwellings	Usable area minus 25% circulation space divided by 75m² dwellings
3.741 m²	2.805,75 m²	93 dwellings	56 dwellings	37 dwellings

There is not much room on the plot to add more volume; however, extending on top of the building could be possible in theory, and it is necessary since the building has a flat roof. However, the fifth

floor seems to have a lighter construction than the floors below it. Thus, the structural integrity of that floor would have to be checked or reinforced to carry more load.

Technical and legal aspects

Since the building has been in use by the same company for several years, it is expected that regular maintenance has taken place. Furthermore, the building looks well-kept and is, at first sight, in decent shape.

The building has five floors and has two lifts (Vastgoeddata, 2023). The number of parking spaces is unknown, though the building has an entrance to a parking space.

Figure 177: Plot of Koningskade 40 with rough measurements on the edited map from Open Street Map (N.D.)

The zoning plan for the area where the building is located indicates that the ground is designated for 'Office-1'. The buildings next to it and along the Koningskade are also designated for office spaces, while those behind the Koningskade 40 are designated for housing, mixed purposes or public functions.

Figure 178: zoning plan of Koningskade 40, pink refers to the function of office, and yellow refers to the function of dwellings. Aerial view of Koningskade 40 and plot of Koningskade 40 (Kadastrale kaart, N.D.) (Google Earth, N.D.)

Conclusion Koningskade 40

According to Vastgoeddata (2023), the rental agreement was renewed in 2023, and the building is still rented out until 2028. Thus, the building will not become empty any time soon. However, from the building's perspective, this building could very well be transformed. It is in a residential area. It has a parking lot (though it might not be sufficient for housing. Has a direct grid structure and is of sufficient size. Next to that, the building has a beautiful appearance.

Building 16 (Oranjestraat 15)

Built year: 1875
Usable area: 9565m²
Energy label: Unknown
Zoning plan: 'Office - 1'
Listed monument: no

(Ruimtelijke Plannen, N.D.; Vastgoeddata, N.D.) *Figure 179: Oranjestraat 15 (Vastgoeddata, N.D.)*

History of building

Multiple addresses are connected to this building: Parkstraat 10, Parkstraat 14, Oranjestraat 15 and Parkstraat 2-A. Of these addresses, Parkstraat 10 and Parkstraat 2-A are municipal monuments. However, Oranjestraat 15- which is part of the building in question- is not. These buildings were Parkstraat 2a up to 14, initially built as dwellings and later reconstructed and connected to create a large office building. The Central Government Real Estate Agency owns this building. It is currently in use (e.g., this is the address for suppliers, express shipments and personal delivery of documents designated for the Raad van State is assigned at this address).

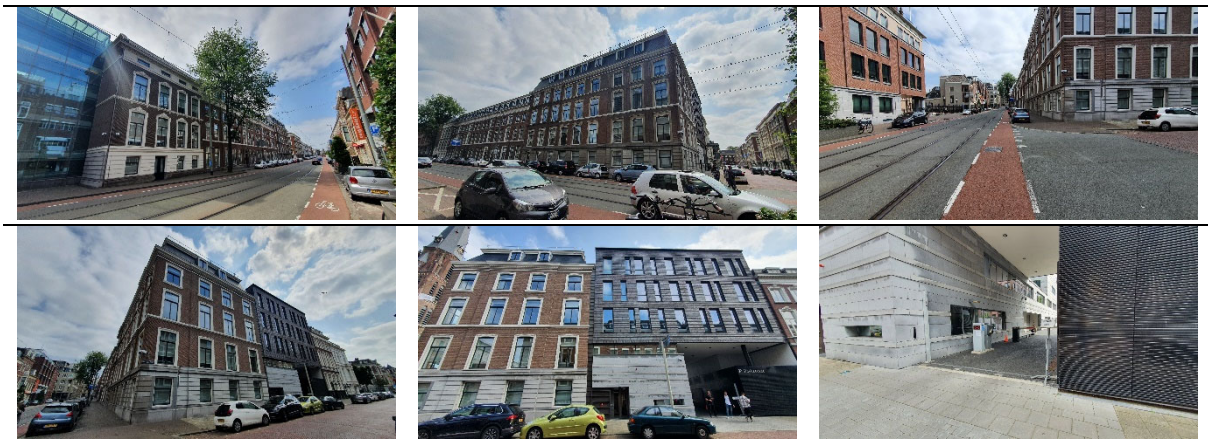


Figure 180: The parking lot in front of the building and the gap between the building and other existing structures (Google Earth, N.D.)

Functional and cultural aspects

The building has five floors and a flat roof (Vastgoeddata, 2023). Since these buildings were first constructed separately, they each have a different front façade. However, the backside of the buildings has been updated to have a more uniform and modern look (figures below). The building has a parking lot with 164 parking spaces shared with other buildings.

Extending on the premise of the building is not possible as there is no space left; however, extending on top of the building would, in theory, be possible.

Figure 181: Picture of the backside of a block of the building (Google Earth, N.D.)

There is a yard in the back of the building and an access point to the underground parking accessible through an opening in the façade (figure below). According to Vastgoeddata (2023), there are 164 parking spots (however, these spots are most likely shared with other buildings).

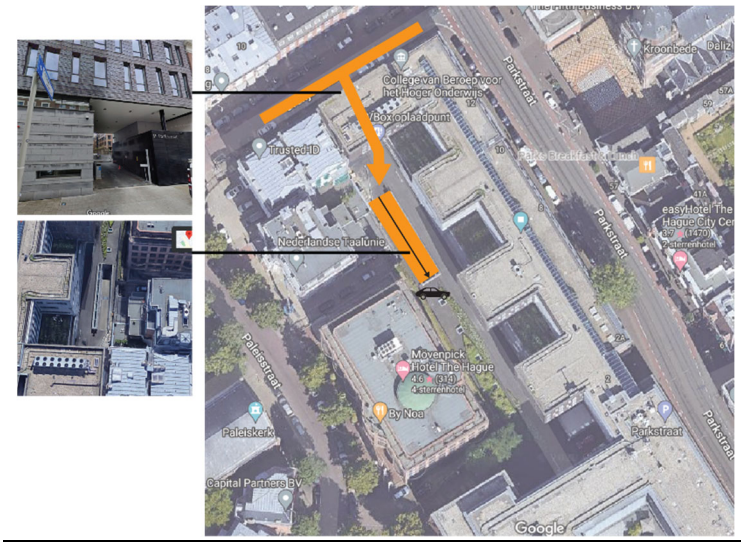


Figure 182: Access to inner courtyard and parking(Google Earth, N.D.)

The building, with a usable area of 9565m², has enough capacity to accommodate a new function such as housing. The table below shows a simple calculation of the number of dwellings achievable after discounting 25% of the usable area for circulation. The number of dwellings is rounded off.

Usable area	Usable area minus 25% circulation space	Usable area minus 25% circulation space divided by 30m² dwellings	Usable area minus 25% circulation space divided by 50m² dwellings	Usable area minus 25% circulation space divided by 75m² dwellings
9565m²	7173,75m²	239,125 dwellings	143,48 dwellings	95,65 dwellings

Technical and legal aspects

As the building is currently owned and operated by the Central Government Real Estate Agency and in use, it is expected that regular maintenance has taken place. Next to that, the building also looks well-kept.

Depth	Minus 2 meters of circulation	Depth of dwelling given corridor	30m²	50m²	75m²	100m²
A	B=A-2m	C=B/2	D=30/C	E=50/C	F=75/C	G=100/C
22	20	10	3	5	7,5	10

Figure 183: Plot of Oranjestraat 15 with rough measurements on the edited map from Open Street Map (N.D.)

The façade of the building has a strict and repetitive grid of windows. However, the windows do not look like they can open.

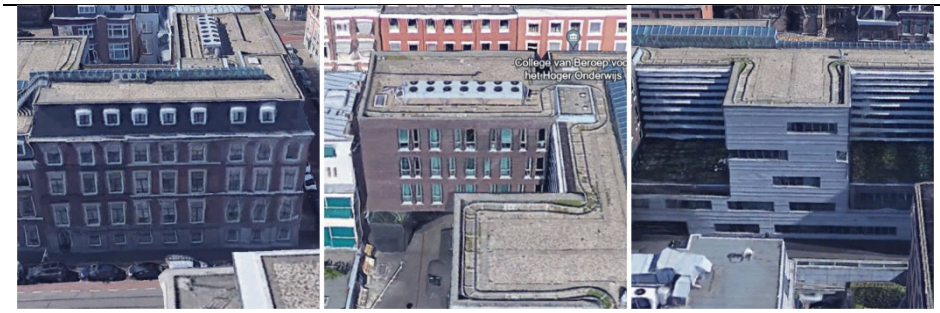


Figure 184: Different window patterns found along the different sides of the building (Open Street Map, N.D.)

The zoning plan for the area where the building is located indicates that the ground is designated for 'Office - 1'. The buildings next to Oranjestraat 15 are designated as 'Office - 1'.

Figure 185: Aerial view of Oranjestraat 15 (Google Earth, N.D.)

Conclusion Oranjestraat 15

These buildings were initially constructed as dwellings and only later transformed into office buildings; thus, reintroducing their residential function should not prove too difficult should the buildings lose their current function. However, the question is whether the Central Government Real Estate Agency would want to part with them. The Raad van State is next to this building block as well.

Building 17 (Oostduinlaan 2)

Built year: 1920
Usable area: 9874m²
Energy label: Unknown
Zoning plan: 'mixed - 4'
Listed monument: no

(Ruimtelijke Plannen, N.D.; Vastgoeddata, N.D.) *Figure 186: Oostduinlaan 2 (Vastgoeddata, N.D.)*

History of building

The building at the Oostduinlaan 2 has been a part of the Shell Campus in The Hague since 2015. The picture below shows the three other buildings in the vicinity, which are also a part of this campus. This building was rented out to Shell by SEB investment. The headquarters of Shell was first located at Oostduinlaan 75, but they left this building a few years prior, whereafter Pinnacle en Bouwinvest built two luxury living towers. In the backyard of the building, 41 parking spaces are found. The Shell Campus also has its own parking space, and the entrance is along the Groenhovenstraat (P icon on the photo below). Furthermore, the building is not a listed monument. The building was last bought in 2017 by Bekke & Partners Real Estate (BPRE) from Goldman Sachs and is currently managed by Savills Property Management (Vastgoeddata, 2023).

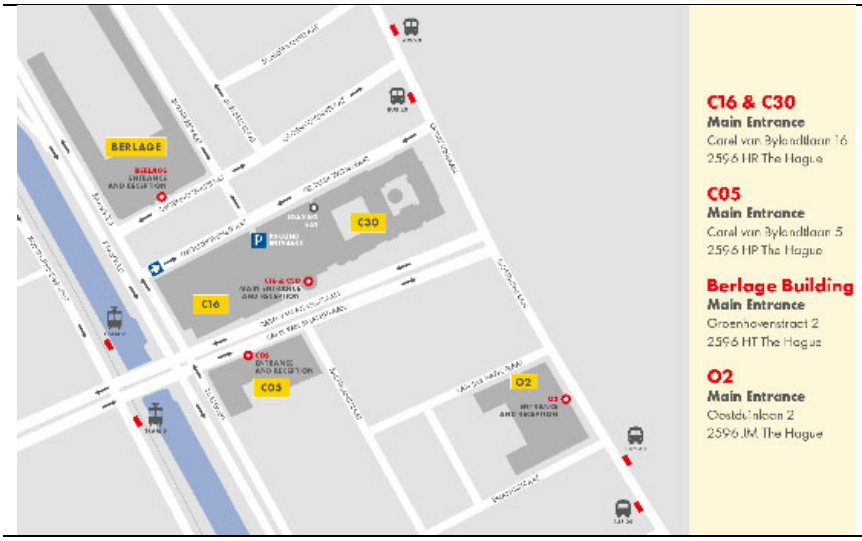


Figure 187: The buildings around the Carel van Bylandtlaan in The Hague form the Shell Campus. The building is called 02 on the bottom right (Shell, N.D.)

Functional and cultural aspects

The building has a distinctive appearance and is made from red brick designed in a strict and repetitive pattern. The entrance of the building is located along the Oostduinlaan, whilst the car parking lot can be accessed from the Van der Haerstraat and the Emantsstraat. The parking lot currently has 41 parking spots (Vastgoeddata, 2023).
The building has four floors (Vastgoeddata, 2023), of which one is half submerged in the ground. The roof is steep, making adding an extension on top of the building impossible.

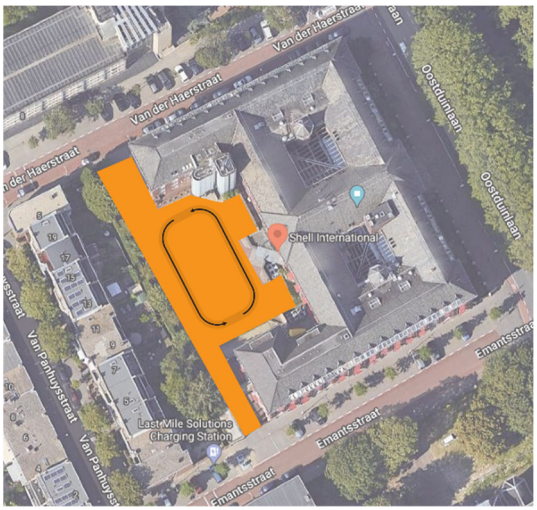


Figure 188: Above-ground parking garage at Oostduinlaan 2 providing 41 parking spaces for the building (own image)

Figure 189: Pictures of the building along the Oostduinlaan 2 showing the left side of the entrance of the building (picture 1), the entrance (picture 2), the right side of the entrance (picture 3)(Vastgoeddata, 2023)

Figure 190: Pictures of the building along the Oostduinlaan 2 showing the left side of the façade along the Emantsstraat (picture 1), the entrance to the parking lot from the Emantsstraat (pictures 2 and 3) (Vastgoeddata, 2023)

Figure 191: Pictures of the building along the Oostduinlaan 2 showing the right side of the façade along the Van der Haerstraat (pictures 1 and 2) and the entrance to the parking lot from the Van der Haerstraat (picture 3) (Vastgoeddata, 2023)

The building, with a usable area of 9874m², has enough capacity to accommodate a new function such as housing. The table below shows a simple calculation of the number of dwellings achievable after discounting 25% of the usable area for circulation. The number of dwellings is rounded off.

Usable area	Usable area minus 25% circulation space	Usable area minus 25% circulation space divided by 30m² dwellings	Usable area minus 25% circulation space divided by 50m² dwellings	Usable area minus 25% circulation space divided by 75m² dwellings

9874m²	7405,5m²	246,85 dwellings	148,11 dwellings	98,74 dwellings	

Since the building has been used recently by a company, it is presumed that the necessary and periodic maintenance has been done. Furthermore, the building looks well-maintained and has a charming exterior.

Technical and legal aspects

The building has a very consistent and repetitive grid of windows on all the facades. Next to that, the height of the floors in the building seems to be very high, which adds to the prominent stately appearance of the building. The building has an external staircase and lift shaft, which were added later and cladded with blue material (picture below). Very little is known of the technical state of the building.

Figure 192: The shafts for the external staircases/lifts (picture 1) and the rhythm of windows in the façade of Oostduinlaan 2 (own image)

The different wings of the building are relatively shallow and provide enough space to realise dwellings. The building has two inner courtyards closed off by a glass roof (figure below). If the building is transformed, this glass structure could be removed to add outdoor green space.

Depth	Minus 2 meters of circulation	Depth of dwelling given corridor	30m²	50m²	75m²	100m²
A	B=A-2m	C=B/2	D=30/C	E=50/C	F=75/C	G=100/C
16	14	7	4,29	7,14	10,71	14,29

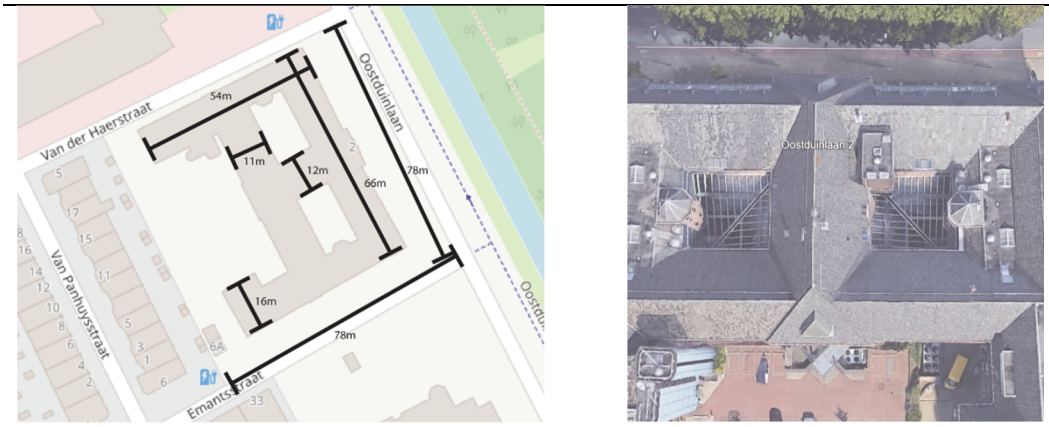


Figure 193: Plot of Oostduinlaan 2 with rough measurements on an edited map (picture 1) and a figure showing the inner courtyards, which are covered by a glass structure (picture 2) (Open Street Map, N.D.)

The zoning plan for the area where the building is located indicates that the ground is designated for 'mixed - 4'. This refers to functions related to culture and leisure (e.g. Music school, theatre),

provision of services, office space, social facilities (e.g. Health care facilities, daycare for children), sports facilities, residential function and parking (Ruimtelijke Plannen, N.D.).

Figure 194: Aerial view of Oostduinlaan 2 and plot of Oostduinlaan 2(Google Earth, N.D.; Kadastrale kaart, N.D.)

Conclusion Oostduinlaan 2

The building has a beautiful appearance and a clear grid of windows, repeated across numerous floors. The fact that the building has its parking lot in the back is a bonus, as well as the two courtyards, which could be used to add public space for users. The windows are large, and the window grid is repeated across all the facades.

Building 18 (De Werf 13)

Built year: 1981
Usable area: 8120 m²
Energy label: Unknown
Zoning plan: 'Business'
Listed monument: no

(Ruimtelijke Plannen, N.D.; Vastgoeddata, N.D.) *Figure 195: De Werf 13 (Vastgoeddata, N.D.)*

History of building

The building, along De Werf 13, was built in 1981 and is currently used as a Logistic centre. However, it is unclear which company currently operates the building. The building is in a business park called Bedrijventerrein ZKD (Zichtenburg-Kerketuinen-Dekkershoek), where all the plots surrounding De Werf 13 also have a business function. Very little is known about the history of the building. Next to this building is a waste collection station, De Werf 11p; however, on the internet, it is reported that the waste collection station is located on De Werf 13. A party last bought the building in 2018 (Vastgoeddata, 2023).

Figure 196: Pictures of the building along the De Werf 13 showing different sides of the building (Google Earth, N.D.)

Functional and cultural aspects

The building consists of two parts. A rectangular part with a pitched roof. This part of the building is completely closed off and covered with brick and metal sheeting. It is unclear whether this part of the building is split into two storeys. In the front of the building is another L-shaped structure built out of yellow brick, where trucks can park to be loaded and unloaded. This part of the building has windows high up on the second floor, with the first floor mainly closed.

Figure 197: Aerial view of De Werf 13 and plot of De Werf 13 (Google Earth, N.D.; Kadastrale kaart, N.D.)

The building, with a usable area of 8120 m², can accommodate a new function such as housing. The table below shows a simple calculation of the number of dwellings achievable after discounting 25% of the usable area for circulation. The number of dwellings is rounded off.

Usable area	Usable area minus 25% circulation space	Usable area minus 25% circulation space divided by 30m² dwellings	Usable area minus 25% circulation space divided by 50m² dwellings	Usable area minus 25% circulation space divided by 75m² dwellings
8120 m²	6090 m²	203 dwellings	122 dwellings	81 dwellings

Technical and legal aspects

It is assumed that the building is currently not in use. Thus, it is also unclear what the level of maintenance currently is. However, since it is built for logistics companies, the building has very few windows located very high on the façade. That, in combination with the depth of the building, would provide sufficient daylight for the function of housing.
Furthermore, the building does not have parking spots on the site.

Facade 1 | Approximately 29.47% of facade is glass.

Figure 198: Rhythm of windows in the façade of De Werf 13(own image)

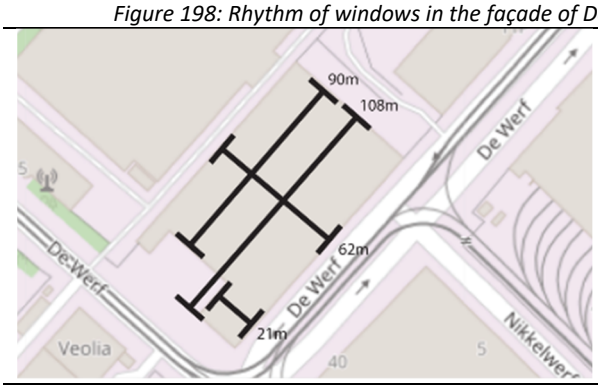


Figure 199: Plot of De Werf 13 with rough measurements on the edited map from Open Street Map (N.D.)

The zoning plan for the area where the building is located indicates that the ground is designated for 'Business'. This refers to business activities, wholesale trade, storage and retail trade in passenger cars (Ruimtelijke Plannen, N.D.).

Conclusion De Werf 13

This building is currently located in an area that is not attractive for housing, and the building does not have the dimensions required to transform it into a function such as housing. Buildings built with the purpose of logistics are very deep and long.

Building 19 (Lange Voorhout 13)

Built year: 1800
Usable area: 3277 m²
Energy label: Unknown
Zoning plan: 'Office-2'
Listed monument: yes

(Ruimtelijke Plannen, N.D.; Vastgoeddata, N.D.) *Figure 200: Lange Voorhout 13 (Monumentenzorg Den Haag, N.D.-b)*

History of building

The office building along the Lange Voorhout 13 is a listed monument (monument nr 17679) because the façade is designed in Louis XIV style. This building has a long history, which dates to approximately 1500. Since then, however, the building has been owned by many parties and has been reconstructed numerous times.

The first building built on this address can be traced back to 1554; it was much smaller and was first owned by the Van der Wijele family until 1611. After which, the building was sold to numerous parties, such as the bailiff of Goes (Jacob Wittensz). After 65 years, the bailiff sold the building to

Philip Jacob (the baron of Boetzelaer). After changing owners five times again, the building was sold in 1764 to provide accommodation for the "Heren van de Admiraliteit" until 1795. After being vacant for a few years, the building was used by a Russian envoy around 1804. In 1836, the building was bought by Jacob Dirk Carel (the baron of Heeckeren van Twickel), and he lived there up to 1842. Jacob then sold the building to King Willem II, who bought it for his newly wedded daughter. Princess Sophie bought the house for herself after her father's passing, but only two years later, she sold it again to the previous owner, the baron of Heeckeren van Twickel. Through inheritance, the building came into the hands of the Bentinck family, who rented out the property from 1885 as they resided elsewhere. The stables and the other outbuildings were demolished in 1939 to make way for a modern office building along the Hoge Nieuwstraat (which is part of the building that has been filtered out by Vastgoed Data). After this, the building passed through more owners (Monumentenzorg Den Haag, N.D.-b).

It is unclear who currently owns the building. However, the building is currently used by Stichting Centrum voor Arbeidsverhoudingen Overheidspersoneel (CAOP). This association connects science, policy, and practice to create a social impact on work-related issues.

Figure 201: Pictures of the building along the Lange Voorhout 13 showing the front of the building (pictures 1,2,3), some ornaments inside and outside of the building (pictures 4,5,7,8,9,10)(Monumentenzorg Den Haag, N.D.-a)

Functional and cultural aspects

The building consists of a souterrain, and then on top of that, there are three more floors underneath a hipped roof with a ridge that runs parallel to the street. The building has seven rows of windows wide. The monumental part has an external fire escape staircase, as seen in the image above. Topping up this part of the building will most likely be impossible, given that it is a monument. Next to that, the roof is also not suitable.

Pictures of the backside of the building can be seen below. This part is made from red brick, has a repetitive windows grid with black window frames, and has a modern look overall. The back part of

the building also cannot easily be topped up, given that the top floor seems to be made from a lighter construction compared to the floors below (figure below).

Figure 202: Pictures of the back side of the building (picture 1,2,3) and a picture of the roof of the building (picture 4) (Google Earth, N.D.)

The building, with a usable area of 3277m², has enough capacity to accommodate a new function such as housing. The table below shows a simple calculation of the number of dwellings achievable after discounting 25% of the usable area for circulation. The number of dwellings is rounded off.

Usable area	Usable area minus 25% circulation space	Usable area minus 25% circulation space divided by 30m² dwellings	Usable area minus 25% circulation space divided by 50m² dwellings	Usable area minus 25% circulation space divided by 75m² dwellings
3277 m²	2457,75 m²	81,925 dwellings	49,155 dwellings	32,77 dwellings

Technical and legal aspects

The level of maintenance is unknown for both the front and the back part of the building. However, the building does look well-kept.

Accessibility might be an issue with a building like this, as it is not clear if the building is equipped with lifts or if that is possible.

All three building levels have the same window pattern, consisting of a row of seven windows. The back side of the building is different; however, it also has consistent rows of windows.

Figure 203: Plot of Lange Voorhout 13 with rough measurements on the edited map from Open Street Map (N.D.)

The zoning plan for the area where the building is located indicates that the ground is designated for 'Office-2'. This creates space for office spaces, and where it is indicated on the zoning plan, parking spaces underneath the ground are also allowed.

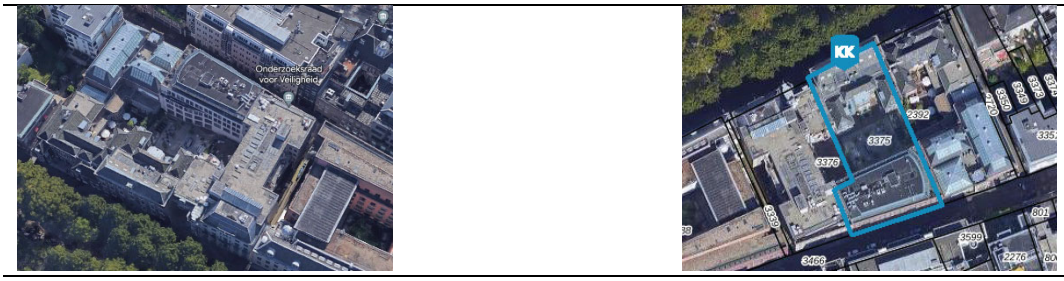


Figure 204: Aerial view of Lange Houtstraat 4 and plot of Lange Houtstraat 4 (Google Earth, N.D.; Kadastrale kaart, N.D.)

Conclusion Lange Voorhout 13

The building is listed as a monument, which could complicate transformation. However, given the location, many other functions are possible. The backside of the building could more easily be transformed into housing.

Building 20 (Prinsessegracht 21)

Built year: 1925
Usable area: 3214 m²
Energy label: Unknown
Zoning plan: 'Mixed-5'
Listed monument: yes

(Ruimtelijke Plannen, N.D.; Vastgoeddata, N.D.) *Figure 205: Prinsessegracht 21 (Wikipedia, 2010)*

History of building

The three-story office building along the Prinsessegracht 21 is a listed monument (monument nr 17949) because the façade is designed in Louis XIV style. Furthermore, this building also features a bay window above the entrance, which extends to the cornice. The building and the rest of the townhouses along the Prinsessegracht 19-29 were designed as dwellings by Johannes Wapperom and Huybert van Schagen in 1730 (Broekhoven et al., 2004).
Documents of the building used throughout the years by different companies can be found online. For example, the Billiton Maatschappij- which was a Dutch mining company- moved their headquarters to the Prinsessegracht 21 in 1927 and moved out again in 1941 (Stichting Haags Industrieel Erfgoed, N.D.-a). Next to that, Tasche en Co.- a company that focused on selling aircraft and aircraft parts- has also had a department in the building since 1919. The building was called 'Vickers House' (Conam, N.D.).
Currently, the building is used by two organizations. Firstly, Zestor is a company that supports the employers and employees of Dutch applied sciences universities. Secondly, Vereniging Hogescholen is an association representing all the 36 publicly funded universities of applied sciences in The Netherlands and the interests of universities of applied sciences as employers in particular.
However, the part of the building that Vastgoeddata marked is the backside of the building and is a later edition constructed in 1925.



Figure 206: picture of the facade in 1937 (picture 1), different pictures of the facade (pictures 2 and 3) (Monumenten Zorg Den Haag, N.D.; Stichting Haags Industrieel Erfgoed, N.D.-a)

Functional and cultural aspects

The part of the building that Vastgoeddata marked is the backside of the building and is a later edition, which was built presumably in 1925. This part of the building is also in use currently and

looks well-kept. This part of the building also looks as if it was upgraded after being built to look modern.

Given the intricate shape of the roof of the building, extending on top of it might not make sense. Extending on the plot of land is not advisable either, as this would cause issues with daylight for both building parts. The building is enclosed on both sides by other structures (though partially on one side), meaning that if transformed, the dwellings would mostly be getting daylight from the front and back of the building.

Figure 207: Pictures of the back side of the building along the Prinsessegracht 21 (Google Earth, N.D.)

Between the building, there is a yard which is accessed from the Kanonstraat (figure below). Firstly, by driving up a small parking space between two buildings along the Kanonstraat and going through a gate.

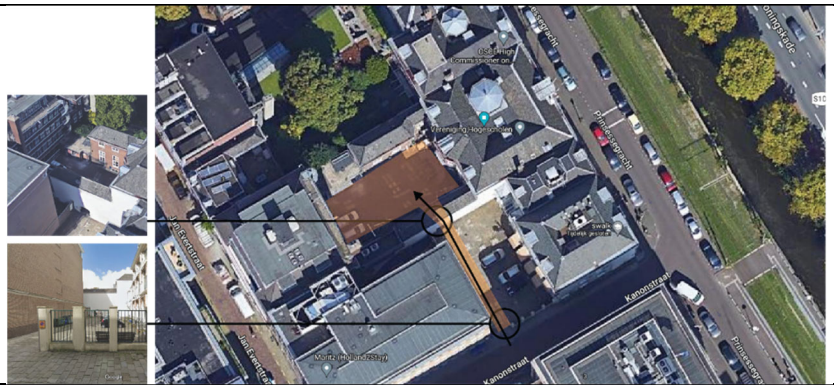


Figure 208: How the yard between the two parts of the building is accessed (Google Earth, N.D.)

The building, with a usable area of 3214m², has enough capacity to accommodate a new function such as housing. The table below shows a simple calculation of the number of dwellings achievable after discounting 25% of the usable area for circulation. The number of dwellings is rounded off.

Usable area	Usable area minus 25% circulation space	Usable area minus 25% circulation space divided by 30m² dwellings	Usable area minus 25% circulation space divided by 50m² dwellings	Usable area minus 25% circulation space divided by 75m² dwellings
3214 m²	2410,5 m²	80,35 dwellings	48,21 dwellings	32,14 dwellings

The building has five floors. This part of the building also has an entrance on the ground floor. On top of that, the second and third floors are identical, and both floors have a row of 9 windows with

concrete awnings. Roof tiles cap the fourth floor; however, the fifth floor has a smaller footprint as the floors below and sticks out through the roof and is capped by a flat roof.
On the back side of the building, there is an external fire escape staircase. Next to that, it is unclear if the building has a lift; however, on top of the fifth-floor rooftop, there seems to be a small grey volume, which could be from a lift box.
The front façade has a regular grid of windows, which are only broken up on the ground floor due to the entrance door placed on the second, third, and fourth floors; each floor has nine windows. The fifth floor has five windows placed in the same grid as the windows below. The sides of the building do not have windows, as buildings (partly) are built next to them. The back side of the façade has a grid and window placement similar to the front of the building.

Depth	Minus 2 meters of circulation	Depth of dwelling given corridor	30m²	50m²	75m²	100m²
A	B=A-2m	C=B/2	D=30/C	E=50/C	F=75/C	G=100/C
18	16	8	3.75	6.25	9.375	12.5

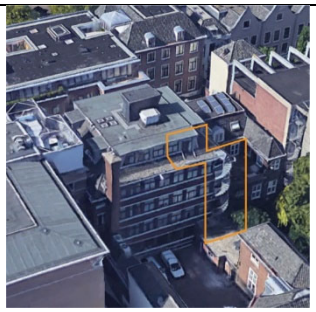


Figure 209: Plot of Prinsessegracht 21 with rough measurements on edited map (picture 1) and external fire escape added in front of façade (picture 2) (Open Street Map, N.D.)

The zoning plan for the area where the building is located indicates that the ground is designated for 'Mixed-5'. This refers to land designated for living spaces, office spaces, the service industry or civic functions (including health care facilities, child care facilities, social associations and welfare institutions) (Ruimtelijke Plannen, N.D.).


Figure 210: Aerial view of Prinsessegracht 21(Google Earth, N.D.)

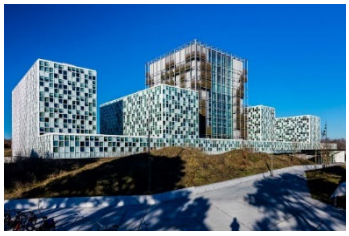
Figure 211: plot of Prinsessegracht 21(Kadastrale kaart, N.D.)

Conclusion Prinsessegracht 21

The building is in an area which is suitable for a large variety of functions. The question is whether the building owner would want to transform it into housing. The front side is a prominent monumental office building, whilst the back of the building was built later and has a more modern look. The back building could quite easily be transformed into housing.

Building 21 (Oude Waalsdorperweg 10)

Built year: 2015
Usable area: 46409 m²
Energy label: Unknown
Zoning plan: 'Social'
Listed monument: no



(Ruimtelijke Plannen, N.D.; Vastgoeddata, N.D.) *Figure 212: Oude Waalsdorperweg 10 (Vastgoeddata, N.D.)*

History of building

The office building along the Oude Waalsdorperweg 10 currently serves as the International Criminal Court (ICC) headquarters. The ICC-being both an intergovernmental organization as well as an international tribunal- is tasked with the prosecution of individuals for international crimes such as genocide, crimes against humanity, war crimes and the crime of aggression (ICC, N.D.).
Before this, the ICC was situated from 2002 to 2015 in an office building formerly belonging to the KPN (figure below). After starting the architectural design competition in 2008, the Danish firm Schmidt Hammer Lassen was chosen out of 171 applicants as their design proposal met the ICC criteria (e.g., on such things as sustainability, design quality, functionality, and costs). The design consists of six connected building volumes, which are designed with a garden motif. The court tower is the volume situated in the middle and contains three of the courtrooms. This tower has a green façade. The other volumes provide office spaces for the different departments of the ICC. The ICC moved permanently to this building in 2015. The current building is a part of The Hague's International Zone (containing also, for example, the Peace Palace, The Hague World Forum, and Europol). It is also situated on the Alexanderkazerne (former military barracks) site. The ICC also has a detention centre located a short distance away. The detention centre is responsible for accommodating people convicted by the court who must serve their sentence and those detained awaiting their trial. The ICC has twelve cells in the Penitentiary Institution at the Scheveningen location.

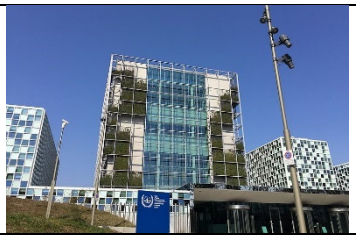




Figure 213: Former (provisional) headquarters of the ICC in The Hague (picture 1), the Court Tower (picture 2), the main entrance to The Hague Penitentiary Institution at the Scheveningen location (picture 3) (Wikipedia, N.D.)

Functional and cultural aspects

The building has a main base layer with six towers sticking out. The tower in the middle is the tallest, whilst the two towers on the left and three on the right are approximately the same height. Next to that, like a modern-day fortress, the main base layer with six towers is surrounded by water (picture 7 below), making the actual building accessible by a bridge behind the first entryway (picture 2 below).
The building has an iconic design inspired by a garden motif, with six volumes sticking out of a main base volume and water surrounding it. The architecture of the building does not, at first sight, stimulate the idea of adding extensions on top, as this would significantly infringe on the original

design. It is most likely possible; however, it can be noted that the building is quite big already; thus, extending might not be as relevant. However, a parking area is also located on the plot of land. New developments could be built in these areas if the need for parking is accounted for in the design.

Figure 214: Selection of pictures of the building along the Oude Waalsdorperweg 10 showing the walk to the entrance, entrance of the building, and different parts of the façade(ICC, N.D.; Mørk, N.D.; Pieters Bouwtechniek, N.D.)

Next to the building, there is a large parking space currently used by visitors of the facility. The parking space is above the ground. It is unclear how many parking spots there are in total.

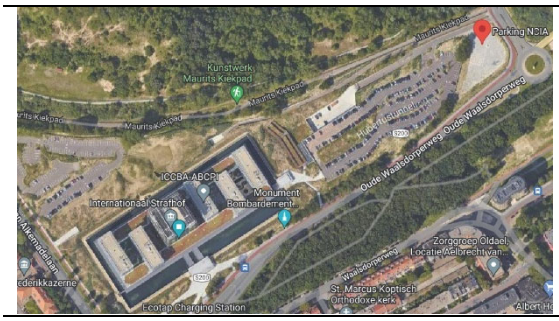


Figure 215: Parking lot on the ground level currently used for visitors (Google Earth, N.D.)

The building, with a usable area of 46409m², has enough capacity to accommodate a new function such as housing. The table below shows a simple calculation of the number of dwellings achievable after discounting 25% of the usable area for circulation. The number of dwellings is rounded off.

Usable area	Usable area minus 25% circulation space	Usable area minus 25% circulation space divided by 30m² dwellings	Usable area minus 25% circulation space divided by 50m² dwellings	Usable area minus 25% circulation space divided by 75m² dwellings
46409 m²	34806,75 m²	1160,225 dwellings	696,135 dwellings	464,09 dwellings

As this building is new and used intensely, it is presumed that regular maintenance has taken place. The building looks, at first glance, well-kept.

Technical and legal aspects

It is unclear to what extent the windows in this building can be opened. From the looks of it, the building looks closed off.

The façade of the building has a regular and straightforward grid repeated across the five smaller volumes; this grid is filled in with either glass panes or opaque white panes, making the façade playful and light. These panels (the glass pane and the opaque white panes) are randomly placed

across the facade. The tallest volume breaks from this pattern as the function of this part of the building is different (the courtrooms are located here).
The presence of courtrooms in the largest tower suggests very tall rooms. For the function of housing, these types of rooms are a waste of square meters unless floors are built within these rooms.

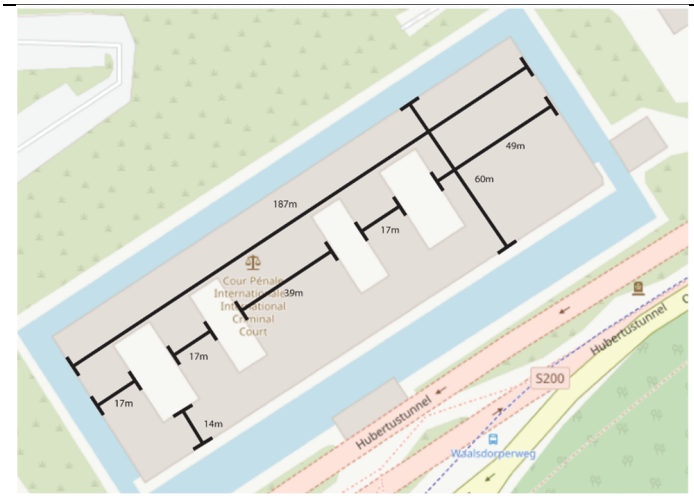


Figure 216: Plot of Oude Waalsdorperweg 10 with rough measurements on the edited map from Open Street Map (N.D.)

The zoning plan for the area where the building is located indicates that the ground is designated for 'Social' function. This refers to functions relating to jurisdiction and or office spaces.

Figure 217: Aerial view of Oude Waalsdorperweg 10 and plot of Oude Waalsdorperweg 10 (Google Earth, N.D.; Kadastrale kaart, N.D.)

Conclusion Oude Waalsdorperweg 10

The building was built specifically for the ICC and is still relatively new. It is improbable that the ICC will need a new building, stimulating them to leave this one. Thus, this building is not expected to become vacant in the coming years.
Even if the building becomes vacant, such a building would not be suitable to transform to the function of housing. A mixed-use function would serve such a building much better, given the sheer size and the location of the building. Furthermore, the area around the building might also have to be redeveloped to make it more attractive. Alternatively, the empty spaces on the plot where parking is currently arranged could be developed.

Building 22 (Van Alkemadelaan 786D 33)

Built year: 1978
Usable area: 12869m²
Energy label: Unknown
Zoning plan: -
Listed monument: no

(Ruimtelijke Plannen, N.D.; Vastgoeddata, N.D.) *Figure 218: Van Alkemadelaan 786 (Google Earth, N.D.)*

History of building

The building along the Van Alkemadelaan 786D 33 is in the Frederikkazerne, a military barrack near Scheveningen. The building referred to (building D33) was built in 1978 and is still in use; however, it is unclear which military department uses it. The image below depicts the grounds of the military barrack in relation to the building referred to (highlighted in red).

The military barrack's construction started in 1929 and was first taken into use in 1938. The Frederikkazerne holds different buildings geared towards the military's functions, such as the Netherlands Institute of Military History (NIHM), a knowledge and research centre for Dutch military history providing publications, education, and archives records. The Militaire Inlichtingen- en Veiligheidsdienst (MIVD) is also located on the premises of the Frederikkazerne.

Figure 219:Frederikkazerne in its totality with the building number 33 marked in red (Municipality of The Hague, 2010)

Functional and cultural aspects

The building has eight floors, and the design of the façade is replicated along all the floors (pictures of the façade can be seen below). The different floors are connected through a lift centrally located in the middle of the building. Next, the building is connected to two neighbouring buildings through two bridges on the second floor. Multiple buildings on the premise of the military barracks are connected in such a matter as can be seen in the second figure below. There are parking spaces between all the buildings on the military barracks; it is unclear how many are assigned for building D33; however, parking spots can be seen both in front of and behind building D33.



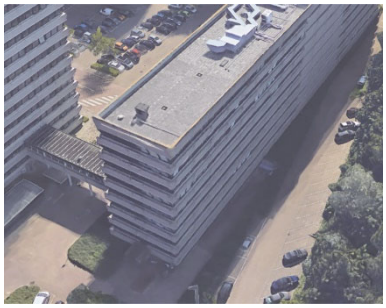


Figure 220: Figure of the façade and entrance of the building along the Van Alkemadelaan 786D 33 (figure 1), the three bridges which connect the different buildings in the vicinity of building D33 (figure 2), one of the sides of the building showing the door connecting to the fire escape staircase-which also is available at the other end of the building (picture 3).

The building, with a usable area of 12869m², has enough capacity to accommodate a new function such as housing. The table below shows a simple calculation of the number of dwellings achievable after discounting 25% of the usable area for circulation. The number of dwellings is rounded off.

Usable area	Usable area minus 25% circulation space	Usable area minus 25% circulation space divided by 30m² dwellings	Usable area minus 25% circulation space divided by 50m² dwellings	Usable area minus 25% circulation space divided by 75m² dwellings
12869m²	9651,75m²	231,725 dwellings	193,035 dwellings	128,69 dwellings

Technical and legal aspects

It is unsure what the level of maintenance of this building is.

The building has a strict horizontal design with large windows that can be opened. This is an advantage given that the dwellings would have sufficient daylight.

On both ends of the building, a door leads to the outside for fire safety (figure above). The fire escape staircase is internal to the building.

Figure 221: Rhythm of windows in the façade of Van Alkemadelaan 786D 33 (own image)

The building is not too deep and not too long, which makes it relatively easy to realize dwellings in it. The repetition across the different floors also makes it easy to design a layout and repeat across the different floors.

Depth	Minus 2 meters of circulation	Depth of dwelling	30m²	50m²	75m²	100m²

		given corridor				
A	B=A-2m	C=B/2	D=30/C	E=50/C	F=75/C	G=100/C
15m	13m	6,5m	4,6m	7,69m	11,54m	15,38m

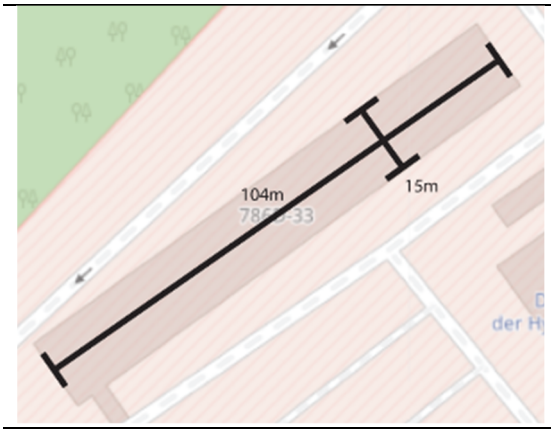


Figure 222: Plot of Alkemadelaan 786 with rough measurements on the edited map from Open Street Map (N.D.)

The ground on which building D33 is found is not included in the Zoning plan of The Hague since it is a military Barack and in use as such.

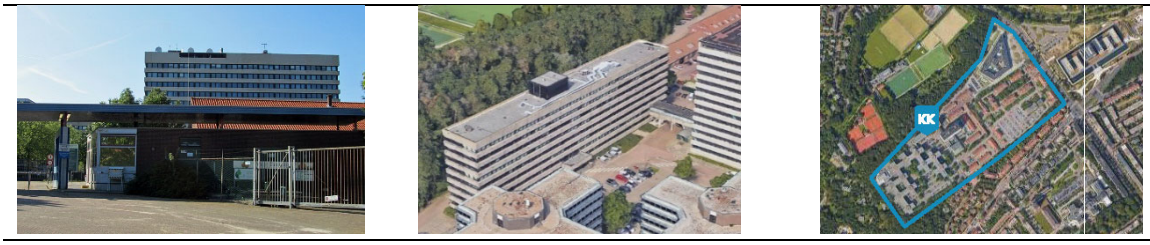


Figure 223: Van Alkemadelaan 786 sticking out from behind the entrance to the barracks, Aerial view of Van Alkemadelaan 786 and plot of Van Alkemadelaan 786 (Google Earth, N.D.; Kadastrale kaart, N.D.; Wikipedia, N.D.)

Conclusion Alkemadelaan 786

This building is suitable for transformation to dwellings when the features of the building alone are considered. It is of decent size, the floor structures are repetitive and predictable, there is sufficient daylight, and the building is not too deep. However, this building is located on the premises of the military Barack. Thus, area development must also be considered before this building can be deemed suitable.

Building 23 (Willem Lodewijklaan 10)

Built year: 2003
Usable area: 3640m²
Occupied area: 1.089 m²
Energy label: Onbekend
Zoning plan: 'office'
Listed monument: no

(Ruimtelijke Plannen, N.D.; Vastgoeddata, N.D.)

Figure 224: Willem Lodewijklaan 10 (NOS, N.D.)

History of building

The building at Willem Lodewijklaan 10 was built in 2003, making it 20 years old and serving as the embassy of the People's Republic of China. The building is not a listed monument and is currently in use. Next to that, very little is known about the history of the building.


Figure 225: Picture of the façade of the embassy (NOS, N.D.; van Reeken, 2018)

Functional and cultural aspects

The building consists of two identical parts interconnected by glass construction (forming the entrance of the building) and a bridge on the fourth floor. The two volumes are made of bricks and have five floors. The fifth floor has a smaller surface area than the floors below, making space for a terrace underneath the roof. The building has its own parking space (underneath the ground) with a separate gate which gives access to it (picture below). Furthermore, the property is fenced off at the front and between the fence and the building, there is a landscaped driveway. Behind the building, there is a yard that connects to another property.

The façade of the two volumes is not identical and has a different window pattern. On both sides of the building, an external spiral staircase can be seen, which has been placed for safety purposes (figure below).

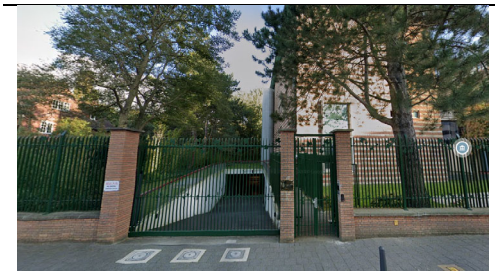



Figure 226: Picture of entrance to the underground parking lot and spiral staircase outside of the building on the left side; a similar staircase is on the right side of the building(Google Earth, N.D.)

The building has a usable area of 3640 m² and can theoretically produce a significant number of dwellings if transformed. The table below shows a simple calculation of the number of dwellings achievable after discounting 25% of the usable area for circulation. The number of dwellings is rounded off.

Given its curved shape, an extension would not be possible on the current roof. An extension on top of the middle of the building (the entrance) is also not advisable as this would limit the daylight possibilities of the two volumes.

Usable area	Usable area minus 25% circulation space	Usable area minus 25% circulation space divided by 30m² dwellings	Usable area minus 25% circulation space divided by 50m² dwellings	Usable area minus 25% circulation space divided by 75m² dwellings
3.640 m²	2.730 m²	91 dwellings	54,6 dwellings	36,4 dwellings

The building is not a listed monument. The embassy's architecture significantly differs from the neighbouring buildings in the street (e.g., Willem Lodewijklaan 2 and 4 are houses from 1927). Next to that, there are a lot of trees and plants on the premises of the property, also giving the building

a very green look. Given that the building currently serves as an embassy, it is gated, which gives it a relatively private impression. The building is also located along a narrow street where traffic is only allowed one-way. On-street parking is currently only allowed in the designated area in the street, specifically for embassy visitors.

Technical and legal aspects

The grid of windows seems to be irregular, which means that for the function of housing, more windows would potentially need to be added. Specifically, the walls of the two volumes do not have many windows.

The building has two lifts (one in each volume), two external emergency staircases and a bridge connecting the fourth floor.

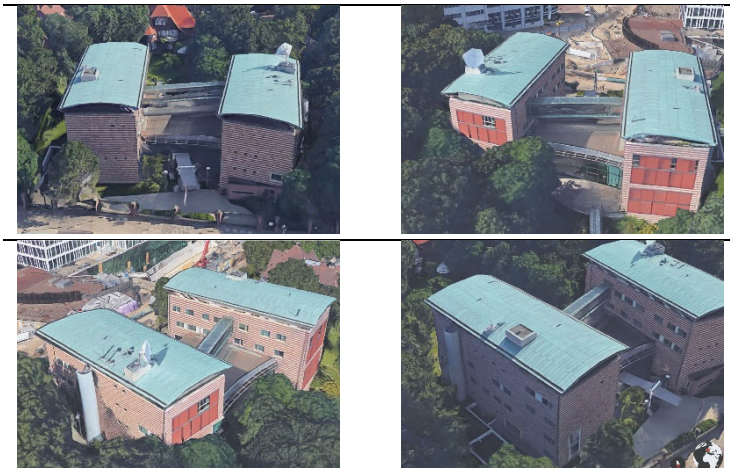


Figure 227: Picture of different sides of the façade showing the difference in window placement. The front of the building is almost completely closed off (picture 1) compared to the back of the building (picture 2)(Google Earth, N.D.)

The depth of the two volumes could potentially allow for dwellings to be built as the two volumes are approximately 13m deep. The table below shows the potential dimensions of possible dwellings once 2 meters are withheld for the corridor. For this building, this could mean two rows of dwellings, which are approximately 5,5m deep connected by a corridor.

Depth	Minus 2 meters of circulation	Depth of dwelling given corridor	30m²	50m²	75m²	100m²
A	B=A-2m	C=B/2	D=30/C	E=50/C	F=75/C	G=100/C
13m	11m	5,5m	5,5m	9m	13,6m	18m

Figure 228: Plot of Willem Lodewijklaan 10 with rough measurements on the edited map from Open Street Map (N.D.)

The zoning plan for the area where the building is located indicates that the ground is designated for 'office'.

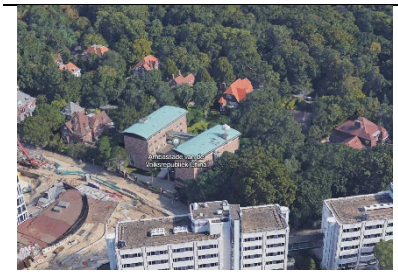


Figure 229: Aerial view of Willem Lodewijklaan 10(Google Earth, N.D.)

Figure 230: plot of Willem Lodewijklaan 10(Kadastrale kaart, N.D.)

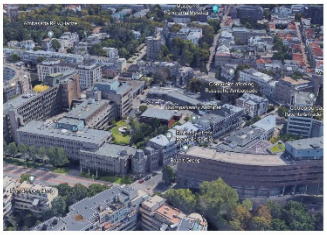
Conclusion Willem Lodewijklaan 10

This building is currently in use as an embassy (and there are no active plans for moving to another building in the area). This would mean this building is unsuitable unless the embassy decides to move to another one. Nonetheless, the simple structure of the building (2 wings connected by a lower structure in the middle) makes this building a relatively simple and straightforward project. Extra windows might have to be added, or the existing ones might have to be enlarged depending on how the building layout is arranged. Given the type of buildings in the direct area (e.g., other embassies), the target group that aligns with these activities (e.g., higher-end housing) must be chosen.

Appendix C

Example of a sheet with basic information about the buildings

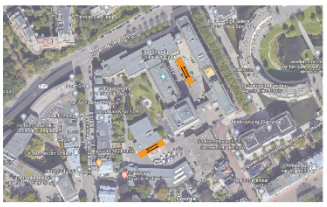
Below is an example of the a4 sheets with basic information about the buildings provided to developers at Van Wijnen to calibrate the research results. The sheets contained basic information regarding the appearance of the building, the built year, the size of the building, the energy label, the status of the zoning plan, the monumental status of the building, a table showing the distance to several facilities relevant for the function of housing, and the location of the building about the rest of The Hague.







Alexanderveld 125 Built year: 1958 Usable area: 48.317 m² Energy label: G Zoning plan: 'Public Interest - 1' Listed monument: partly municipal

Cars					
	Parking lot	230	3	1	1
	Parking lot +bored car	300	4	1	1
	Parking space with charging station	2	1	1	1
Public transport					
	Bus stop (local bus)	650	11	6	8
	Train station	2400	30	11	9
	Tramstop	850	11	6	8
Shop for daily necessities		550	7	3	5
City center/ shopping area		1900	24	8	5
Hospitality/Food service industry					
	Bar				
	Restaurant/cafe	500	5	2	3
Basic medical facilities					
	physio	350	4	3	2
	pharmacy	650	8	3	3
	doctors practice	850	11	4	4
	hospital	2400	29	9	7
Culture					
	Cinema	1700	21	8	6
	Theatre	550	7	4	4
sports					
	Indoor sports venue	900	11	6	4
	outdoor sports venue	2000	25	8	6
	swimming pool	2200	27	10	7
Neighbourhood meeting-places					
	Park/square	280	3	2	1
Educational facilities					
	Middle school	1100	2	4	2
	High school	1200	15	5	5
	University	2400	29	6	6

Alexanderveld 125 Built year: 1958 Usable area: 48.317 m² Energy label: G Zoning plan: 'Public Interest - 1' Listed monument: partly municipal

Appendix D

Discussion of buildings with developers Van Wijnen

Interviews were held with developers in which they were asked to order the group of buildings into three categories: "would most likely transform"," everything in between", and" would most likely not transform". The image below shows how the buildings were ordered by the developers interviewed and where the buildings labelled most likely to transform are in The Hague. This exercise aimed to get insight into how professionals would rate the buildings to calibrate the analysis results produced through the Conversion Meter.

2. Alexanderveld 125
8. Saturnusstraat 9
9. Van Alkemadelaan 786-D-33
12. Oostduinlaan 2
15. Bezuidenhoutseweg 60
18. Scheveningseweg 64
19. Leggelostraat 85
21. Koningskade 40
22. Willem Lodewijklaan 10

Rank of buildings labeled "would most likely transform" Dev 1

Rank of buildings labeled "would most likely transform" Dev 2

Appendix E

The number of office buildings with a minimum size of 3000m² which have an energy label worse than C (and which are not listed monuments) ordered by decreasing population density of Dutch municipalities (compiled on 13 November 2023) (Centraal Bureau voor de Statistiek, 2023a; Vastgoeddata, 2023)

Compiled on 13/11/2023		
Municipality	Inhabitants per km² of land	Number of office buildings larger than 3000m2 with energy label D,E,F,G, or unknown
's-Gravenhage (gemeente)	6 827	26
Leiden	5 816	10
Haarlem	5 662	7
Amsterdam	4 880	51
Capelle aan den IJssel	4 777	7
Delft	4 681	12
Gouda	4 565	3
Schiedam	4 528	4
Maassluis	4 180	0
Rijswijk (ZH.)	4 150	13
Utrecht (gemeente)	3 924	20
Krimpen aan den IJssel	3 845	1
Hoorn	3 692	2
Zoetermeer	3 689	18
Oegstgeest	3 530	1
Veenendaal	3 528	2
Nijmegen	3 456	8
Papendrecht	3 428	0
Vlaardingen	3 214	4
Hendrik-Ido-Ambacht	3 159	2
Rotterdam	3 040	27
Heemstede	3 029	0
Nieuwegein	2 794	3
Eindhoven	2 769	15
Diemen	2 744	2
Katwijk	2 685	1
Huizen	2 609	2
Amersfoort	2 572	11
Barendrecht	2 493	0
Leiderdorp	2 406	1
Leidschendam-Voorburg	2 384	4
Beverwijk	2 327	0
Alblasserdam	2 320	0
Voorschoten	2 309	0
Amstelveen	2 297	6
Zwijndrecht	2 217	4
Maastricht	2 200	7
Zaanstad	2 165	3
Westervoort	2 155	0
Kerkrade	2 082	1
Gorinchem	2 055	2
Hilversum	2 047	9
Sliedrecht	2 038	1
Ridderkerk	2 022	0
Heerlen	1 940	9
Tilburg	1 809	7
Helmond	1 785	3
Hillegom	1 747	1
Uithoorn	1 735	0
Almere	1 725	3
Arnhem	1 696	22
Urk	1 661	0
Aalsmeer	1 645	0
Brunssum	1 606	4
IJsselstein	1 594	0
Dordrecht	1 566	14
Pijnacker-Nootdorp	1 564	1
Stede Broec	1 529	0
Velsen	1 528	3
Landgraaf	1 512	0
Enkhuizen	1 491	0
Lisse	1 490	1
Breda	1 483	16
Oldenzaal	1 481	0
Veldhoven	1 465	4
Gooise Meren	1 456	2
's-Hertogenbosch	1 450	12
Heemskerk	1 446	0
Dijk en Waard	1 438	1
Westland	1 423	6
Zeist	1 374	2
Teylingen	1 360	1
Hengelo (O.)	1 353	4
Wageningen	1 347	2
Vlissingen	1 314	3
Geldrop-Mierlo	1 304	0
Heiloo	1 300	0
Tiel	1 299	1
Groningen (gemeente)	1 284	10
Harderwijk	1 256	0
Den Helder	1 254	8
Albrandswaard	1 217	0
Lansingerland	1 216	0
Zwolle	1 196	7
Zutphen	1 186	2
Nissewaard	1 184	1
Total		**440**
Total of all Dutch municipalities		**696**

Compiled on 13/11/2023		
Municipality	Inhabitants per km² of land	Number of office buildings larger than 3000m2 with energy label D,E,F,G, or unknown
Stein (L.)	1 184	1
Waddinxveen	1 175	0
Sittard-Geleen	1 173	9
Enschede	1 146	5
Blaricum	1 128	0
Hardinxveld-Giessendam	1 108	7
Almelo	1 101	2
Middelburg (Z.)	1 033	4
Soest	1 026	2
Culemborg	1 016	0
Alkmaar	1 014	7
Purmerend	1 004	0
Roermond	989	1
Doesburg	959	0
Borne	944	0
Laren (NH.)	944	1
Dongen	930	1
Houten	921	1
Best	912	0
Alphen aan den Rijn	907	0
Bergen op Zoom	861	0
Assen	848	4
Oostzaan	841	0
Venlo	832	9
Geertruidenberg	831	0
Haarlemmermeer	823	17
Zuidplas	811	2
Etten-Leur	806	0
Oosterhout	804	0
Waalre	803	0
Deventer	787	4
Noordwijk	774	2
Waalwijk	774	1
Baarn	769	2
Beek (L.)	766	0
Lingewaard	762	1
Scherpenzeel	753	0
Doetinchem	749	1
Bunschoten	740	0
Duiven	736	0
Castricum	732	0
Roosendaal	729	5
Nuenen, Gerwen en Nederwetten	714	0
Uitgeest	703	0
Meerssen	696	0
Son en Breugel	694	1
Renkum	685	2
Stichtse Vecht	685	5
Edam-Volendam	677	0
De Bilt	663	4
Harlingen	649	0
Nijkerk	649	1
Simpelveld	649	0
Meppel	639	3
Wijchen	629	0
Beuningen	609	0
Voorne aan Zee	607	1
Bloemendaal	602	0
Woerden	601	3
Ouder-Amstel	596	1
Oss	583	1
Heusden	581	1
Valkenswaard	574	0
Goirle	563	0
Zandvoort	547	0
Hattem	545	0
Leusden	538	1
Leeuwarden	535	7
Vught	535	1
Rheden	533	2
Maasgouw	532	1
Wassenaar	529	4
Landsmeer	522	0
Druten	520	0
Wijdemeren	519	1
Sint-Michielsgestel	516	0
Wijk bij Duurstede	504	0
Apeldoorn	492	8
Boxtel	489	1
Weert	488	2
Zevenaar	486	2
Rhenen	484	0
Beesel	482	0
Bodegraven-Reeuwijk	482	1
Smallingerland	479	2
Loon op Zand	477	0
Total		**145**

Compiled on 13/11/2023		
Municipality	Inhabitants per km² of land	Number of office buildings larger than 3000m2 with energy label D,E,F,G, or unknown
Mook en Middelaar	463	0
Beekdaelen	459	0
De Ronde Venen	457	0
Meierijstad	455	0
Kaag en Braassem	453	0
Overbetuwe	447	1
Valkenburg aan de Geul	447	0
Zoeterwoude	446	1
Hoogeveen	442	0
Bunnik	434	1
Wormerland	431	1
Maashorst	429	3
Vaals	427	0
Goes	426	3
Neder-Betuwe	424	0
Heumen	423	0
Laarbeek	420	0
Halderberge	417	1
Midden-Delfland	413	3
Oisterwijk	411	1
Vijfheerenlanden	411	0
Berg en Dal	410	0
Gilze en Rijen	410	1
Rijssen-Holten	409	0
Maasdriel	395	0
Kampen	394	1
Voerendaal	394	0
Woudenberg	393	0
Krimpenerwaard	389	0
Zaltbommel	386	1
Ede	384	6
Utrechtse Heuvelrug	382	5
Medemblik	380	0
Elburg	377	4
Nieuwkoop	375	0
Gennep	373	1
Montfoort	371	0
Rucphen	367	1
Veendam	364	0
Lelystad	363	2
Bernheze	360	0
Barneveld	351	2
Kapelle	351	0
Montferland	349	1
Drechterland	346	0
Waterland	339	0
Eijsden-Margraten	335	0
Hoeksche Waard	334	1
Boekel	324	0
Emmen	324	2
Ermelo	321	0
Twenterand	319	0
Renswoude	313	0
Echt-Susteren	310	0
Eemnes	309	0
Bergen (NH.)	304	1
Drimmelen	295	0
Opmeer	294	0
Koggenland	293	0
Putten	292	0
Oude IJsselstreek	291	0
Altena	289	0
Peel en Maas	284	1
Zwartewaterland	284	0
Aalten	282	0
Deurne	282	0
Schagen	282	1
Bladel	279	0
Achtkarspelen	275	0
Cranendonck	273	0
Stadskanaal	273	0
Venray	273	3
Heerenveen	272	1
Oost Gelre	271	0
Land van Cuijk	268	0
Hellendoorn	263	0
Oudewater	263	0
West Maas en Waal	263	0
Wierden	263	1
Gemert-Bakel	257	1
Pekela	253	0
Brummen	252	0
Someren	250	0
Molenlanden	249	0
Oldebroek	248	0
Asten	246	0
Total		**52**

Compiled on 13/11/2023		
Municipality	Inhabitants per km² of land	Number of office buildings larger than 3000m2 with energy label D,E,F,G, or unknown
Heerde	245	0
West Betuwe	244	3
Eersel	243	0
Tynaarlo	242	0
Woensdrecht	242	2
Losser	237	0
Moerdijk	237	3
Roerdalen	235	0
Haaksbergen	234	0
Horst aan de Maas	231	3
Reimerswaal	229	0
Dantumadiel	227	0
Raalte	225	0
Nunspeet	223	0
Leudal	222	4
Midden-Groningen	221	6
Terneuzen	220	5
Tytsjerksteradiel	218	0
Epe	213	0
Winterswijk	212	0
Buren	208	1
Voorst	205	0
Hardenberg	200	1
Goeree-Overflakkee	197	0
Lopik	195	0
Gulpen-Wittem	194	0
Bergeijk	189	0
Oirschot	189	1
Zundert	187	0
Tholen	183	0
Dalfsen	179	1
Westerkwartier	179	1
Nederweert	175	1
Reusel-De Mierden	174	0
Súdwest-Fryslân	174	1
Oldambt	172	0
Berkelland	171	4
Eemsdelta	169	0
Hilvarenbeek	168	0
Steenbergen	168	0
Hof van Twente	167	1
Veere	166	0
Borsele	164	0
Olst-Wijhe	164	1
Waadhoeke	164	0
Lochem	161	0
Heeze-Leende	160	0
Noordenveld	159	1
Steenwijkerland	157	0
Dinkelland	152	0
Schouwen-Duiveland	151	0
De Fryske Marren	148	0
Tubbergen	146	0
Hollands Kroon	138	1
Hulst	137	1
Opsterland	134	0
Staphorst	132	0
Dronten	131	3
Bronckhorst	128	1
Bergen (L.)	127	0
Coevorden	121	2
Noardeast-Fryslân	121	3
Weststellingwerf	120	1
Ooststellingwerf	116	1
Alphen-Chaam	113	0
De Wolden	110	0
Noordoostpolder	109	0
Ommen	105	1
Het Hogeland	101	0
Midden-Drenthe	100	0
Westerwolde	96	4
Zeewolde	96	0
Borger-Odoorn	94	1
Aa en Hunze	93	0
Baarle-Nassau	93	0
Noord-Beveland	91	0
Texel	86	0
Sluis	83	0
Westerveld	71	0
Ameland	68	0
Rozendaal	63	0
Terschelling	57	0
Vlieland	31	0
Schiermonnikoog	23	0
Total		**59**

Appendix F

Tables of the Conversion Meter used: (1) initial appraisal of unoccupied office using veto criteria, (2) feasibility scan using gradual criteria at the location level, (3) feasibility scan using gradual criteria at the building level and (4) determination of the conversion class.

Step 1 quick scan: initial appraisal of unoccupied office using veto criteria					
Aspect		Veto criterion		Assessment	
Veto criteria market				Yes	No
1.	Demand for housing	1.	There is a demand for housing of local target groups	-	-
veto criteria stakeholders					
2.	Initiator (advisor)	2.	Presence of enthusiastic influential investigator	-	-
		3.	Does meet criteria for region, location, accessibility	-	-
3.	Developer	4.	Does meet criteria on size and character of building	-	-
4.	Owner	5.	Willingness to sell the building	-	-
		6.	Willingness to buy and transform the building	-	-
5.	Investor	7.	The transformation is financially feasible	-	-
6.	Municipality	8.	Positive attitude of the municipality	-	-
veto criteria location					
		9.	Zoning plan/ provincial ordinance permits modification	-	-
7.	Urban location	10.	No serious public health risk (pollution, noise, odour)	-	-
veto criteria building					
8.	Dimensions of skeleton	11.	Free ceiling height >2,60m (lower limit existing structure is 2,1m)	-	-
			Result quick scan	0	0

Step 2 Feasibility scan using gradual criteria at location level					
Aspect		Gradual criterion		Assessment	
Functional				Yes	No
1.	Urban location	1.	Building in suitable area	-	-
		2.	Good daylight/sunlight possibilities	-	-
		3.	Good view from building, >75% floor space	-	-
2.	Distance and quality of facilities	4.	Store for daily necessities (450-1000 meters)	-	-
		5.	Neighbourhood meeting places (<500)	-	-
		6.	Hospitality (500-1000 meters)	-	-
		7.	Basic medical facilities (450-1000 meters)	-	-
		8.	Sports facilities (300-900 meters)	-	-
		9.	Educational facilities (250-900m)	-	-
3.	Accessibility by public transport	10.	Bus stop (local bus) (200-500 meters)	-	-
		11.	Small train station (2km)- Main station (5km)	-	-
		12.	Tram/ metro stop (200-500 meters)	-	-
4.	Accessibility by car and parking facilities	13.	Good flow, normal street quality	-	-
		14.	Example for The Hague; office with reception City centre >0,9 parking lot/100 m2 office space Pre-war districts >1,1 parking lot/100 m2 office space Post-war districts >1,4 parking lot/100 m2 office space	-	-
Cultural					
5.	Representative impression	15.	Situated centrally (not near highway locations)	-	-
		16.	Other buildings present in direct nieghbourhood	-	-
		17.	Lively nieghbourhood	-	-
		18.	Area has a good reputation/image; no vandalism	-	-
		19.	Area has good air quality, low pollution, and noise hindrance	-	-
Legal					
6.	Urban location	20.	Noise load on façade<50db	-	-
7.	Ownership of location	21.	land in property or with long lease	-	-
				0	0
			Total location (=number yes):	0	x
			Default weighting:	5	=
			Maximum score location:	105	
			Feasibility scan location	0	A

Step 2 Feasibility scan using gradual criteria at building level					
Aspect		Gradual criterion		Assessment	
Functional				Yes	No
1.	Year of construction or renovation	1.	Building> 3 years	-	-
		2.	Building renovated> 3 years	-	-
2.	Vacancy	3.	Complete building is vacant	-	-
		4.	Building vacant>3 years	-	-
3.	New housing (the minimum capacity is dependent on type of developer/investor; most projects are between 500-5000m2)	5.	Capacity building> 100 1p-units /30m2	-	-
		6.	Lay-outs adaptable for local target groups	-	-
4.	Extendibility	7.	Horizontal extension building possible (neighbouring buildings)	-	-
		8.	Vertical extension building possible (no inclined roof/light construction)	-	-
Cultural					
5.	Representative impression (related to impression of location)	9.	Identifiable compared to surrounding buildings	-	-
		10.	Own identity realizable	-	-
6.	Cultural heritage	11.	Being not a (listed) monument; simplifies transformation	-	-
7.	Access (entrance, elevators, stairs)	12.	Clear, safe and clarifying building entrance	-	-
Technical					
8.	Condition of maintenance	13.	Well-maintained; maintenance up-to-date (focus on the load bearing structure being sound)	-	-
9.	Dimensions of support structure	14.	Depth of building allows for the realization of hallway plus dwellings with acceptable depth dimensions	-	-
		15.	Grid support structure>3,60m	-	-
		16.	Height dimension between floors <4.00m	-	-
10.	Support structure (walls, columns, floors)	17.	Condition support structure is good/not hazardous	-	-
11.	Façade external living space dependent of target group cultural heritage: limited /no adaptability	18.	Possible connection inner walls on grid <5,40m	-	-
		19.	Façade/openings well adaptable	-	-
		20.	Façade windows can be reused/opened	-	-
12	Installations	21.	Sufficient service ducts can be constructed	-	-
Legal					
13.	Environment	22.	Absence of large amount of hazardous materials in building	-	-
		23.	Acoustic insulation of floors >5db	-	-
		24.	Good thermal insulation of facades and roof	-	-
		25.	Sufficient daylight factors ≥ 10% floor area of new units (m2)	-	-
14.	Dutch Environment and Planning Act, escape and access routes	26.	Elevators available / easy realizable in building (>4 stories)	-	-
		27.	(Emergency) stairways available / realizable	-	-
		28.	Distance of new units to stairs/ elevators <45m	-	-
				0	0

Total building (=number yes):	0	x
Default weighting:	3	=
Maximum score building:	84	
Feasibility scan building	0	B

Step 3 Determination of conversion potential class of office building		
Conversion score	Conversion class	
Conversion score location + Building = 0-37	Class 1: No transformation potential	0
Conversion score location + Building = 38-75	Class 2: Hardly any transformation potential	
Conversion score location + Building = 76-113	Class 3: Limited transformation potential	
Conversion score location + Building = 114-151	Class 4: High transformation potential	189
Conversion score location + Building = 152-189	Class 5: Excellent transformation potential	