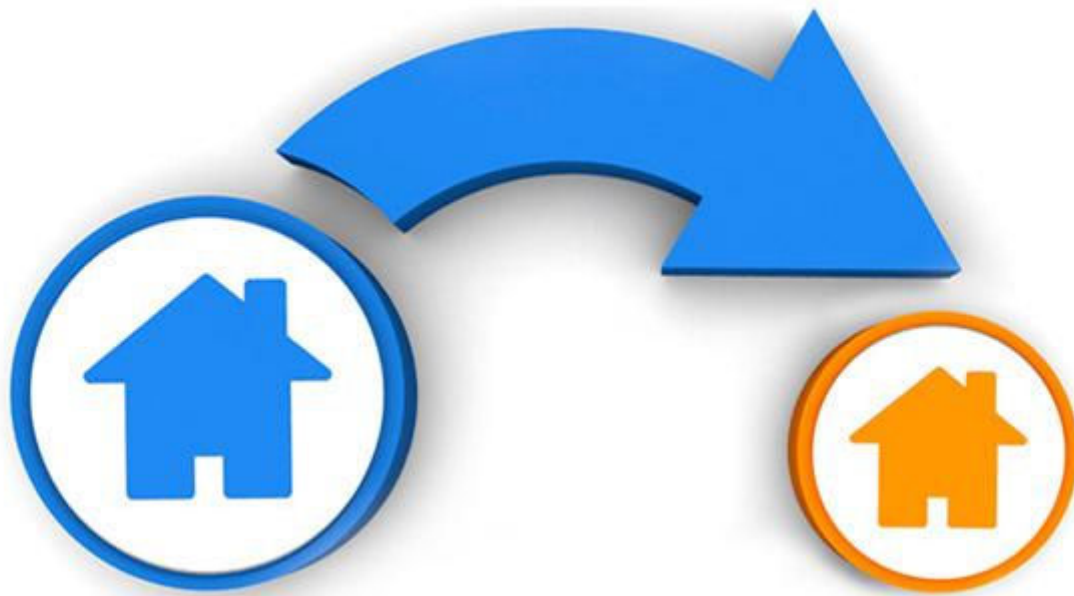


Downsizing the municipal real estate portfolio

A multi criteria decision support system for defining the added value of public real estate for a municipal organization and applying the right selling method



Master thesis

Author: *Niels Ahsmann*

Student number: *0654249*

Date of final presentation: *24-11-2015*

Graduation program: *Construction management and Engineering*

Graduation committee:

Prof. Dr. Ir. B de Vries

Dr. Han Qi

Dr. J.J.A.M Smeets

Msc. M. van Kats – Schouwerwou

TU Eindhoven

TU Eindhoven

TU Eindhoven

Brink Groep

Chairman graduation committee

1st supervisor

2nd supervisor

3rd supervisor

Preface

Dear reader,

Before you lies my graduation thesis. This report is the result of a research study in the field of public real estate management. With this report I complete my study Construction Management and Engineering at the Technical University of Eindhoven. This research study was conducted in collaboration with Brink Groep B.V., a managing and consulting company for building projects, housing advice, and real estate.

The purpose of this research study is to gain insight in public real estate management and making different kind of values of real estate measurable. Many municipalities are dealing with budget cuts and are managing their real estate portfolio not carefully enough. A major opportunity arises for municipalities to revalue their real estate portfolio by not solely looking to the monetary value of real estate as well as social value and strategic value. In this research study a model has been prepared to assign an overall added value of a real estate object for the municipal organization. With this model the municipality will become more aware of which real estate objects are important for their organization and which are not and can therefore be managed by other parties, i.e. municipalities will gain more grip in defining the added value of the real estate in their portfolio.

I would like to thank my graduation committee for their time, effort, input and guidance during this graduation process. I would like to thank Han Qi for her expertise on the research method and her guidance in the process. Jos Smeets for his expertise and critical view on my research study. Maaïke van Kats for keeping me inspired and motivated during my graduation process and exploring all possibilities. Fourth, I would like to thank Michel van Rhee for his expertise and practical knowledge on public real estate management. The respondents which took time to fill out the questionnaire deserve a mentioning in this preface as well.

Finally I would like to thank all of my friends and family for making this graduation and my entire study period in Eindhoven possible. It was a great learning experience which I can carry with me in my following step in my professional career.

Niels Ahsmann

November 18th, 2015

Content

Preface.....	3
Content.....	5
List of figures	9
List of Tables.....	10
Summary	11
Samenvatting.....	15
1. Introduction.....	19
1.1. Municipalities and their real estate.....	19
1.2. Problem definition.....	21
1.3. Research design	21
1.4. Expected results.....	23
1.5. Relevance.....	23
1.5.1. Societal relevance	23
1.5.2. Scientific relevance.....	23
1.6. Reading guide	23
2. Glossary	25
2.1. Introduction.....	25
2.2. Municipal organization	25
2.3. Real estate	26
2.3.1. Social real estate	27
2.3.2. Public real estate	27
2.3.3. Commercial real estate	28
2.3.4. Corporate real estate	28
2.4. Real estate management.....	28
2.4.1. Real estate portfolio.....	28
2.4.2. Corporate real estate management.....	29
2.4.3. Public real estate management	30
2.5. Value	30
3. Literature review	33
3.1. Introduction.....	33
3.2. Factors influencing the decision behavior.....	34
3.2.1. Municipality.....	34
3.2.2. Types of real estate	36
3.2.3. Conclusion	38

3.3.	Real estate management.....	39
3.3.1.	Corporate real estate management.....	40
3.3.2.	Public real estate management	42
3.3.3.	Conclusion	43
3.4.	Added values of real estate	44
3.4.1.	Added values from user perspective.....	46
3.4.2.	Added values from strategic perspective.....	47
3.4.3.	Added values from financial perspective	49
3.4.4.	Conclusion	50
3.5.	Selling methods for public real estate.....	51
3.5.1.	Selling methods	51
3.5.2.	Deciding to sale	53
3.5.3.	Discussion	57
3.6.	Conclusion	57
3.6.1.	Factors influencing the decision behavior	57
3.6.2.	The added value of real estate.....	58
3.6.3.	Applying Selling methods onto public real estate.....	59
4.	Research Approach	61
4.1.	Introduction	61
4.1.1.	Problem introduction	61
4.1.2.	Relevant scholarship	61
4.1.3.	Hypothesis.....	62
4.2.	Research method.....	62
4.2.1.	Basics of AHP	62
4.2.2.	Consistency.....	64
4.2.3.	Application of AHP	64
4.3.	Questionnaire	66
4.3.1.	Respondent characteristics	66
4.3.2.	Preparing the questionnaire	66
4.3.3.	Questionnaire design	69
4.4.	Data analysis	69
4.4.1.	Outcome of the questionnaire.....	70
4.4.2.	Consistency.....	70
4.4.3.	Preparing the data.....	71
4.4.4.	Processing the data	73

4.5.	Results from data analysis	74
4.5.1.	Differences between types of real estate	74
4.5.2.	Social real estate	76
4.5.3.	Own housing real estate	77
4.5.4.	Commercial real estate	78
4.5.5.	Conclusion on data analysis	79
4.5.6.	Discussion on data analysis	80
4.6.	Case study	81
4.6.1.	Scores for sub criteria	82
4.6.2.	Rating the alternatives	84
4.6.3.	Results of case study	85
4.6.4.	Discussion on case study	88
4.7.	Conclusion	89
4.7.1.	How do the factors influence the decision behavior?	89
4.7.2.	How do the criteria relate to each other?	90
5.	Conclusions	91
5.1.	Conclusion	91
5.2.	Discussion	93
5.3.	Recommendations	94
6.	References	95

List of figures

- Figure 1: Matrix marketability versus added value of real estate
- Figure 2: Matrix courant versus toegevoegde waarde van vastgoed
- Figure 3: Research design
- Figure 4 Flipped direction model (Aardema & Korsten, 2009)
- Figure 5: Schematic overview of social and public real estate in the real estate market
- Figure 6: Porter Value added chain ("Porter's Value Chain • BusinessSetFree.com," n.d.)
- Figure 7: levels of managerial processes (Prins & Veuger, 2012)
- Figure 8: Real estate organization structure. Left the decentralized structure and right the centralized structure
- Figure 9: Corporate real estate management model for campus management (den Heijer, 2011)
- Figure 10: layout of perspectives and added values of real estate
- Figure 11: Matrix marketability versus added value of real estate
- Figure 12: Structure of AHP model
- Figure 13: AHP model applied on research study
- Figure 14: Illustration of set of pairwise comparisons from the questionnaire
- Figure 15: Weights of main criteria per type of real estate
- Figure 16: Global weights of sub criteria per type of real estate
- Figure 17: Proposed layout for questionnaire
- Figure 18: overview map of selected real estate objects for study case
- Figure 19: Matrix marketable versus overall added value with four real estate objects
- Figure 20: layout of perspectives and added values of real estate
- Figure 21: Matrix marketability versus added value of real estate for the municipal organization

List of Tables

- Table 1: Categorization of sizes of municipalities by CBS (“CBS StatLine - Gemeentelijke afvalstoffen; hoeveelheden,” 2015)
- Table 2: Overview of categorization of real estate portfolios of municipalities
- Table 3: Overview of available literature on corporate and public real estate management
- Table 4: List of added values of real estate (Nourse & Roulac, 1993), (De Jonge, 1996), (Lindholm & Leväinen, 2006), (Scheffer et al., 2006), (de Vries et al., 2008), (den Heijer, 2011), and (Van der Zwart, 2011)
- Table 5: Ranking order of not marketable to marketable real estate (van der Geert, 2006)
- Table 6: Saaty scale pairwise comparison values (Saaty, 1990)
- Table 7: Number of consistent sets with a CI of 0,15
- Table 8: Responding municipalities with basic characteristics
- Table 9: Number of respondents per category and response rates
- Table 10: Overview of categories calculated geometrical means in
- Table 11: Number of cases per selection of criteria for the three types of real estate combined
- Table 12: Weights of criteria for Eindhoven study case
- Table 13: Overview of overall scores of added value of the real estate objects from the case study

Summary

In the Netherlands municipalities own a relatively large share of the real estate available on the Dutch Market (De Wit, 2007a). Several researchers and experts in the field state that municipalities lack a decent real estate management organization (Teuben, 2011). Teuben states that public real estate is managed inefficient and unprofessional by several municipalities and should therefore be sold. Another trend which is developing is the vacancy rate in social real estate. Approximately half of the social real estate market is owned by municipalities and researchers have forecasted that the vacancy of social real estate will increase significantly in the coming years (van Bentum, 2014). Therefore the major opportunity arises for municipalities in downsizing their real estate portfolio. The following research question can be formulated:

How could a municipality make the decision to apply the most suitable selling method onto a real estate object which does not add sufficient value to the municipal organization?

In order to define the most suitable selling method for a particular real estate object one must define the marketability of the real estate object and the added value of the real estate for the municipal organization. When defining the added value one must consider four factors that influence the decision behavior in assigning the weights of the various criteria are defined with the accompanying groups:

- Type of real estate (social real estate, own housing real estate, and commercial real estate)
- Type of organization structure (real estate company, centralized organization structure, and decentralized organization structure)
- Size of the municipality (smaller than 20.000 inhabitants, 20.000-50.000 inhabitants, 50.000-100.000 inhabitants, and more than 100.000 inhabitants)
- Demographic transition (Shrinkage (<0%), stagnation (0% - 3,4%), and strong growth (3,4% <))

In public real estate management three types of perspectives are taken into account when decision are made:

- User perspective: As reasoned from the end user, these are visitors, employees, and other individuals that use the real estate to exploit activities.
- Strategic perspective: This concerns the long term real estate decisions as reasoned from governmental level; should the decision fit in the goals and the vision of the municipality.
- Financial perspective: This perspective takes the available funding into account, the cash flow as well as the overall financial position.

The defined set of criteria which define the added value of real estate are categorized into the three mentioned perspectives in the following way:

- User perspective
 - o Improving productivity; *to increase production through a more effective use of real estate*
 - o Increasing user satisfaction; *to create functional, pleasant and comfortable places for visitors, consumers and employees*

-
- Improving culture; *to improve interpersonal relations and communication by real estate*
 - Strategic perspective
 - Improving flexibility; *to structure a real estate portfolio in such a way that future spatial, technical, organizational and juridical adjustments are possible*
 - Supporting image; *To express municipal objectives by using real estate as an icon for the organizational culture*
 - Increasing innovation; *to stimulate renewal and improvement of primary processes, products and services by real estate*
 - Financial perspective
 - Reducing costs; *to reduce investment costs, capital costs, operational costs and other real estate related costs*
 - Control risks; *to anticipate on future real estate related technical and financial opportunities and risks*
 - Improving the financial position; *to improve the overall financial position of the organization by regarding real estate as an asset*

The weight of importance of the various criteria differ per influencing factor. The most important differences are:

- User perspective is considered relatively important for own housing real estate.
- Social real estate is considered as a core task of the municipality to execute, strategic perspective is considered relatively important, as well as the productivity of the real estate.
- Commercial real estate is considered as real estate to achieve indirect effects with, e.g. improving the culture, improving the flexibility of the real estate portfolio, and increasing the innovation of the municipality. However, the financial perspective is relatively important.
- A centralized organization are managing their real estate portfolio more professional. They are more aware of the financial possibilities and limitations of the different types of real estate.
- The same goes for larger municipalities. They are more aware of their tasks and aware of their financial possibilities and limitations
- The stagnating municipalities are not subjected to strong changing situation. They do not have to change their real estate portfolio drastically. Their aim is to improve the quality of the real estate instead of changing the composition and the size of the real estate portfolio.
- The shrinking municipalities are operating with a declining local real estate market. This affects their real estate as well, therefore they have very strict financial demands for commercial real estate. They are aware of the minimum standards of social real estate and their own housing real estate. They are not willing to cut expenses on these two types of real estate at any cost.
- The strongly growing municipalities feel less pressure since the local real estate market is growing. This has a positive effect on the municipal real estate portfolio. The

financial perspective is less important for every type of real estate compared to other municipalities.

- The criteria supporting image and improving culture are found relatively unimportant throughout every group of municipalities. Supporting image is unimportant since municipalities are not willing to spend excessive amounts of public money on iconic architecture. Improving culture is unimportant since the results of this criteria are noticed in the long term and has an indirect effect on the user.

The marketability and the added value of real estate determine the matrix as depicted in figure 1. The following four quadrants can be identified:

- Left bottom, sell unless monumental status gets lost, sell with selling method E
- Left top, sell with selling method A or E
- Right bottom, obtain method F; maintain the real estate object in the portfolio
- Right top, if the object is used for a time span shorter than 10 years apply selling method B, C, or D

The selling methods used for public real estate in this matrix are (figure 1):

- public sale with unconditional bidding
- Public sale with unconditional and/or conditional bidding
- Public sale with simple preselection
- Public sale with unconditional bidding and an extensive preselection
- Public sale via a real estate broker
- Keep real estate object in real estate portfolio

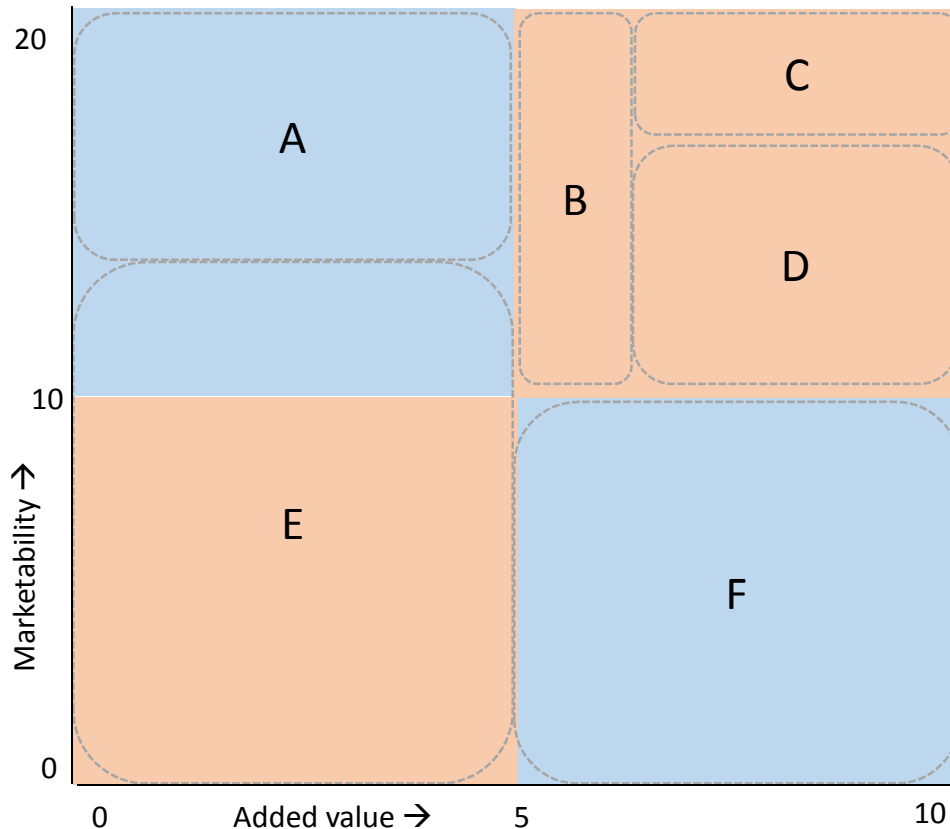


Figure 1: Matrix marketability versus added value of real estate

Samenvatting

Nederlandse gemeenten bezitten een relatief groot aandeel van het beschikbare vastgoed op de Nederlandse markt (De Wit, 2007a). Verschillende onderzoekers en experts stellen dat gemeentes geen goede publiek vastgoed management organisatie hebben (Teuben, 2011). Teuben stelt dat publiek vastgoed inefficiënt en onprofessioneel wordt gemanaged door verschillende gemeente en zij zouden daarom (deels) hun vastgoed moeten afstoten. Een andere trend die kan worden waargenomen is de groeiende leegstand in maatschappelijk vastgoed. Ongeveer de helft van het maatschappelijk vastgoed is in het bezit van gemeentes en verschillende onderzoekers voorspellen dat de leegstand in maatschappelijk vastgoed significant toeneemt in de komende jaren (van Bentum, 2014). Hierdoor ontstaat de mogelijkheid voor gemeenten om hun vastgoedportefeuille af te slanken. Uit deze mogelijkheid ontstaat de volgende onderzoeksvraag:

Hoe kan een gemeente de beslissing nemen om de meest geschikte verkoopmethode toe te passen op een vastgoedobject dat niet voldoende waarde toevoegt voor de gemeentelijke organisatie?

Om te bepalen welke verkoopmethode het meest geschikt is voor een specifiek vastgoed object zal de mate waarin dit object courant is bepaald moeten worden. Daarnaast moet de toegevoegde waarde van het object voor de gemeente bepaald worden. Wanneer deze toegevoegde waarde bepaald wordt dient men de volgende vier factoren in overweging te nemen. Deze vier factoren beïnvloeden het beslissingsgedrag omtrent het toewijzen van gewichten aan de criteria die de waarde bepalen. Deze factoren zijn:

- Type vastgoed (maatschappelijk vastgoed, eigen huisvesting vastgoed en commercieel vastgoed)
- Organisatiestructuur (vastgoedbedrijf, gecentraliseerde vastgoed organisatie en gedecentraliseerde vastgoedorganisatie)
- Grootte van de gemeente (minder dan 20.000 inwoners, 20.000 – 50.000 inwoners, 50.000 – 100.000 inwoners en meer dan 100.000 inwoners)
- Demografische transitie van de gemeente (krimp (<0%), stagnatie (0% - 3,4%) of sterke groei (3,4% >))

In publiek vastgoed management worden drie perspectieven gehanteerd wanneer vastgoed gerelateerde beslissingen worden gemaakt:

- Gebruikersperspectief: gezien vanuit de eindgebruiker, dit zijn bezoekers, werknemers en andere individuen die gebruik maken van het vastgoed
- Strategisch perspectief: Dit betreft de lange termijn beslissingen rondom vastgoed, geredeneerd vanuit bestuurlijk niveau; past de beslissing in de doelstellingen en de visie van de gemeente?
- Financieel perspectief: dit perspectief neemt de beschikbare financiële middelen, de beschikbare kasstromen en de financiële positie van het vastgoed op de balans in ogenschouw.

De gegeven set aan criteria die de toegevoegde waarde van vastgoed voor de gemeentelijke organisatie bepalen zijn onderverdeeld naar de drie genoemde perspectieven op de volgende manier:

-
- Gebruikersperspectief
 - Verbeteren van de productiviteit; *om de productiviteit te verhogen door middel van het effectief gebruiken van het vastgoed*
 - Verhogen van de gebruikerstevredenheid; *het creëren van een functionele, aangename en comfortabele omgeving voor bezoekers, klanten en werknemers*
 - Verbeteren van de cultuur; *het verbeteren van de interpersoonlijke relaties en communicaties door middel van het vastgoed*
 - Strategisch perspectief
 - Verbeteren van de flexibiliteit; *om de vastgoed portefeuille zo te organiseren dat toekomstige ruimtelijke, technische, organisatorische en juridische veranderingen mogelijk zijn.*
 - Imago; *door het vastgoed in te zetten als icoon en als expressie voor de organisatiecultuur en gemeentelijke doelstellingen*
 - Verhogen van de innovatie; *het stimuleren van vernieuwingen en verbeteringen van primaire (bedrijfs-)processen, producten en dienstverleningen door middel van het vastgoed*
 - Financieel perspectief
 - Het reduceren van de kosten; *het reduceren van de investeringskosten, financieringskosten, exploitatiekosten en andere vastgoed gerelateerde kosten*
 - Het controleren van risico's; *het anticiperen op toekomstige vastgoed gerelateerde technische en financiële kansen en bedreigingen*
 - Het verbeteren van de financiële positie; *het verbeteren van de algehele financiële positie van de organisatie door de positie van vastgoed als vaste activa op de balans*

De gewichten van de belangrijkheid van de verschillende criteria verschillen per groep binnen de vier genoemde factoren. De belangrijkste verschillen zijn:

- Gebruikersperspectief is relatief belangrijk voor eigen huisvesting
- Maatschappelijk vastgoed wordt gezien als primaire taak van de gemeente om uit te voeren. Het strategisch perspectief is hier relatief belangrijk, daarnaast ook de productiviteit van het vastgoed
- Commercieel vastgoed wordt gezien als vastgoed waarmee indirecte effecten mee gerealiseerd kunnen worden, e.g. het verbeteren van de cultuur, het verbeteren van de flexibiliteit van de vastgoedportefeuille en het stimuleren de innovatie van de gemeente. Echter, het financieel perspectief is bij dit type vastgoed van groot belang
- Een gecentraliseerde organisatie structuur is beter in staat om hun vastgoed op een professionelere wijze te managen. Zij zijn beter op de hoogte van de financiële beperkingen en mogelijkheden van de verschillende type vastgoed
- Hetzelfde geldt voor grote(re) gemeenten. Zij zijn beter op de hoogte van hun taken en van de financiële beperkingen en mogelijkheden per type vastgoed
- De gemeenten die te maken hebben met een stagnerende bevolkingsgroei worden niet onderworpen aan sterk veranderende omstandigheden. Zij hoeven hun vastgoedportefeuille niet drastisch te wijzigen. De focus bij deze gemeenten ligt eerder op het verbeteren van de kwaliteit van het vastgoed in plaats van het veranderen van de samenstelling van de vastgoedportefeuille
- De krimp gemeenten hebben te maken met een teruglopende lokale vastgoedmarkt. Dit heeft een sterk effect op het vastgoed dat in het bezit is van de gemeente. Ze zijn

zich bewust van de minimale standaarden van maatschappelijk vastgoed en vastgoed gebruikt voor de eigen huisvesting. Deze gemeenten weigeren om ten koste van de kwaliteit te bezuinigen op hun vastgoed

- De sterk groeiende gemeenten hebben te maken met minder druk doordat de lokale vastgoed markt groeiende is. Dit heeft een positief effect op de gemeentelijke vastgoedportefeuille. Het financieel perspectief is van minder belang voor elk type vastgoed in vergelijking met de gemeenten die te maken hebben met een stagnerende of krimpende bevolking.
- De criteria imago en het verbeteren van de cultuur worden relatief onbelangrijk geacht door alle groepen van gemeenten. Imago kan gezien worden als luxe (iconische architectuur), gemeenten zijn niet bereid excessieve publieke gelden hieraan uit te geven. Het verbeteren van de cultuur wordt relatief onbelangrijk geacht doordat de resultaten van het sturen op dit criteria pas merkbaar zijn op de lange termijn en doordat ze alleen een indirect effect hebben op de gebruiker

De toegevoegde waarde van het vastgoed en de mate waarin het object courant is bepalen de diagram zoals afgebeeld in figuur 2. De volgende vier (oranje en blauwe) kwadranten kunnen geïdentificeerd worden in deze diagram:

- Linksonder; *verkopen tenzij de monumentale status verloren gaat. Verkopen met methode E*
- Linksboven; *verkopen met methode A of E*
- Rechtsonder; *behouden in de vastgoedportefeuille*
- Rechtsboven; *als het object voor een tijdsduur korter dan 10 jaar gebruikt wordt dan verkopen met methode B, C of D*

De verkoopmethodes die gebruikt zijn in de diagram zijn (figuur 2):

- Openbare verkoop met onvoorwaardelijke bieding
- Openbare verkoop met onvoorwaardelijke en/of voorwaardelijke bieding
- Openbare verkoop met een eenvoudige voorselectie
- Openbare verkoop met onvoorwaardelijke bieding en een uitgebreide voorselectie
- Openbare verkoop met behulp van een makelaar
- Behoudt het vastgoedobject in de vastgoedportefeuille

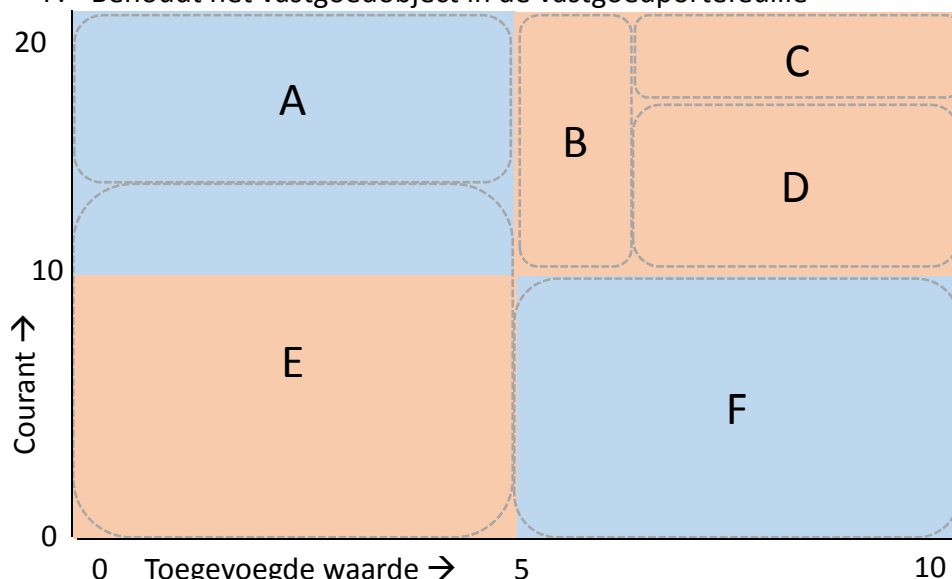


Figure 2: Matrix courant versus toegevoegde waarde van vastgoed

1. Introduction

This chapter provides an introduction in the research study towards the real estate portfolio of Dutch municipalities. The first paragraph will introduce the problem after which a research question and sub questions are defined together with the goal of this research study. The third paragraph will provide the research design and the fourth paragraph the expected results. The last paragraph will provide a reading guide for the remainder of this research study.

1.1. Municipalities and their real estate

The Netherlands are governed by a government which is layered in several levels. The level which is locally operable are the municipalities. They are close to the people and are electable. In the Netherlands municipalities vary from 942 inhabitants, municipality of Schiermonnikoog, up to 810.937 inhabitants, municipality of Amsterdam ("CBS - Gemeentelijke indeling op 1 januari 2015," 2015). Every single one of them owns a certain amount of real estate. On the website of the Dutch government eleven core tasks are listed that a municipality in the Netherlands is responsible for ("Taken van een gemeente | Gemeenten | Rijksoverheid.nl," n.d.). These tasks concern the administration and service for their inhabitants and to support the ones who need financial support by social security. However, there are some tasks of the municipality which are in close line with the construction industry. They are responsible for the zoning plans in the region and the infrastructure around the built environment to make every object accessible. The municipality has a direct relation with the real estate market since they are responsible for the accommodation of educational means and they accommodate or subsidies several cultural and sports associations in one way or another.

An example of how the municipalities obtained all of this real estate is that the educational real estate has shifted from the national government to municipalities in 1997. Which meant that the total real estate portfolio of municipalities increased significantly (De Wit, 2007b, p. 200). In 2007 Vastgoedmarkt conducted a research together with ROZ (vereniging Raad van Onroerende Zaken; union of Council for Real Estate) towards the real estate management of municipalities (De Wit, 2007a). At that moment many municipalities were transforming their real estate management from the different departments towards one central real estate management department; 'this centralization must lead to a more efficient and effective management' (De Wit, 2007b, p. 200).

An article in the journal 'Facilitair weekblad' emphasizes this lack of efficiency and effectiveness by stating that some municipalities do not have a clear overview of their real estate portfolio (Duivis, 2013a). An interview of the Dutch news program 'Nieuwsuur' with Professor Hans de Jonge points out this lack of overview as well (*Nieuwsuur*, 2013a). Prof. Hans de Jonge speaks of amateurism and inefficiency when it comes to building maintenance. Gross & Zróbek emphasize this inefficiency as well, they state the lack of proper information management systems and due to the 'numerous goals, sometimes contradictory and often difficult to define' (Gross & Zróbek, 2015). In this same interview Daniel van der Ree, member of the council of Amsterdam, shows a report about the real estate portfolio of the municipality of Amsterdam. This reports states that the municipality owns around 2300 objects where the alderman, who is responsible for the real estate portfolio of the municipality, estimated the total amount of real estate objects approximately 1000 objects lower than the actual amount. One and a half year before the outcome of the report (*Nieuwsuur*, 2013a). This item in

Nieuwsuur (*Nieuwsuur*, 2013b) was based on an article which was published in the Vastgoedmarkt and researched by Brink Groep and the Technical University of Delft (Aalbers & Heijnders, 2013). In this study the researchers make several conclusions on their experiences which could help to improve the current situation.

To make an assumption on the size of the market they base their numbers on a research study by 'Bouwstenen voor Sociaal' and 'BBN adviseurs' (van der Wal & de Moel, 2011). They calculated that the total amount of social real estate in 2011 was 87.9 million square meters. Healthcare and educational functions are each responsible for approximately 30 million square meters. The national government owns 4.5 million square meters. Other functions that are counted as social real estate users are: child day care services (3,9 million m²), sports accommodations (5,7 million m²), cultural accommodations like museums and libraries (2,7 million m²), welfare functions (2,6 million m²), and other functions like municipality offices, police buildings, and fire stations (8,6 million m²) ("Maatschappelijk vastgoed | Bouwstenen voor Sociaal," n.d.).

In this same report the total amount of office space is calculated on 46,8 million m² and the retail industry with its distribution on 34,6 million m² which is a total of 81,4 million m² ("Maatschappelijk vastgoed | Bouwstenen voor Sociaal," n.d.). This means that there is more social real estate than there is commercial real estate in the Netherlands. 'The municipalities in the Netherlands altogether own 42 million square meters of social real estate, half of the total supply of real estate' (van Bentum, 2014). Van Bentum states that from the total social real estate market '25% to 50% of this supply – 83,5 million square meters in total - will become vacant in the coming ten to twenty years' (van Bentum, 2014). Roland Duivis noticed this phenomenon as well in his article in 'Weekblad Facilitair' (Duivis, 2013). Due to the budget cuts of the municipalities they are looking into their real estate portfolio with more care. In this article Wicher F. Schönau states that the real estate portfolio of the municipality can contribute for a significant part on cutting the expenses of the municipality (Duivis, 2013). Several municipalities are reducing the vacancy in their portfolios on a large scale by selling real estate object (Duivis, 2013).

As stated, the municipalities in the Netherlands all together possess a large share of the real estate market in the Netherlands ("Maatschappelijk vastgoed | Bouwstenen voor Sociaal," n.d.). Teuben mentions in his research article that Dutch municipalities should diminish their real estate portfolio significantly since many private companies are able to manage social real estate objects as well which implies that municipalities do not necessary need to manage these real estate objects (Teuben, 2011). The Dutch government and the Rijksvastgoedbedrijf, the governmental company who is responsible for the entire real estate portfolio of the Dutch national government, has obtained the strategy of downsizing the governmental organization and therefore downsizing the real estate portfolio of the Dutch government as well. In order to make sure every object will be handled with the right amount of care in the future the Rijksvastgoedbedrijf defined five selling methods which they apply onto their real estate objects they are trying to sell ("Rijksvastgoedbedrijf, Onze speerpunten," 2015)

1.2. Problem definition

From the introduction in the previous paragraph it is clear that there is a major opportunity for municipalities to save costs by improving their real estate management. This applies on a more efficient maintenance and management of the portfolio as well as looking into the option of selling real estate objects from the portfolio that are inefficiently managed by the municipality and are not adding value to the municipal organization. To be able to make this decision every individual real estate object from the real estate portfolio should be checked for its adding value for the municipality's goals and policies. Since there are many criteria influencing the added value of the real estate for the organization some guidance is preferred. However, every municipality differs from other municipalities so it is necessary to discover the factors that influence this decision making process to be able to provide proper guidance to an individual municipality. When the added value of a particular real estate object has been established one can act on follow up moves. If the real estate object does not add significant value to the municipality an option might be to sell the real estate. The right selling method needs to be applied on that specific real estate object since every object and its context require the right selling method. Looking to the problem definition the following main research question arises:

How could a municipality make the decision to apply the most suitable selling method onto a real estate object which does not add sufficient value to the municipal organization?

In order to provide a proper answer to the main research question there are several sub questions formulated that serve as input for answering the main research question:

- *What factors influence the decision behavior in determining the added value of real estate for the municipal organization?*
- *How do these factors influence the decision behavior?*
- *What criteria define the added value of real estate object to the municipal organization?*
- *How do these criteria relate to each other and what is their relative importance?*
- *Which selling methods are used for public organizations and how can a municipality decide which selling method is most suitable for a specific real estate object?*

With the outcome of these research questions decision makers within municipalities are able to make well considered decisions on every real estate object within their real estate portfolio, whether to keep it in the portfolio or to sell it to another party and to decide what would be a suitable selling method to do this with.

1.3. Research design

This research study consists of three parts. First a literature review is conducted to examine the four elements as can be seen in the research design in figure 3; factors influencing the decision behavior, public real estate management, real estate added values, and selling methods. These four topics are examined in the third chapter on the basis of a literature review. This results in an AHP (Analytical Hierarchy Process) tree structure which will serve as input for the second part of the research.

The research model consists of three parts. The weighing of the criteria and sub criteria (which determine the added value of real estate) is done via a questionnaire, which will be analyzed. The selection and scoring of alternatives is done via a case study. These three parts will generate several results which will be discussed in two parts.

First the dataset is used to find out how the factors are influencing the decision behavior when defining the added value of real estate for the municipal organization. Second, the final scores of the alternatives from the case study will be discussed and an advice is given on what follow up actions need to be taken with the various alternatives. Together this whole research study will provide an answer to the main research question.

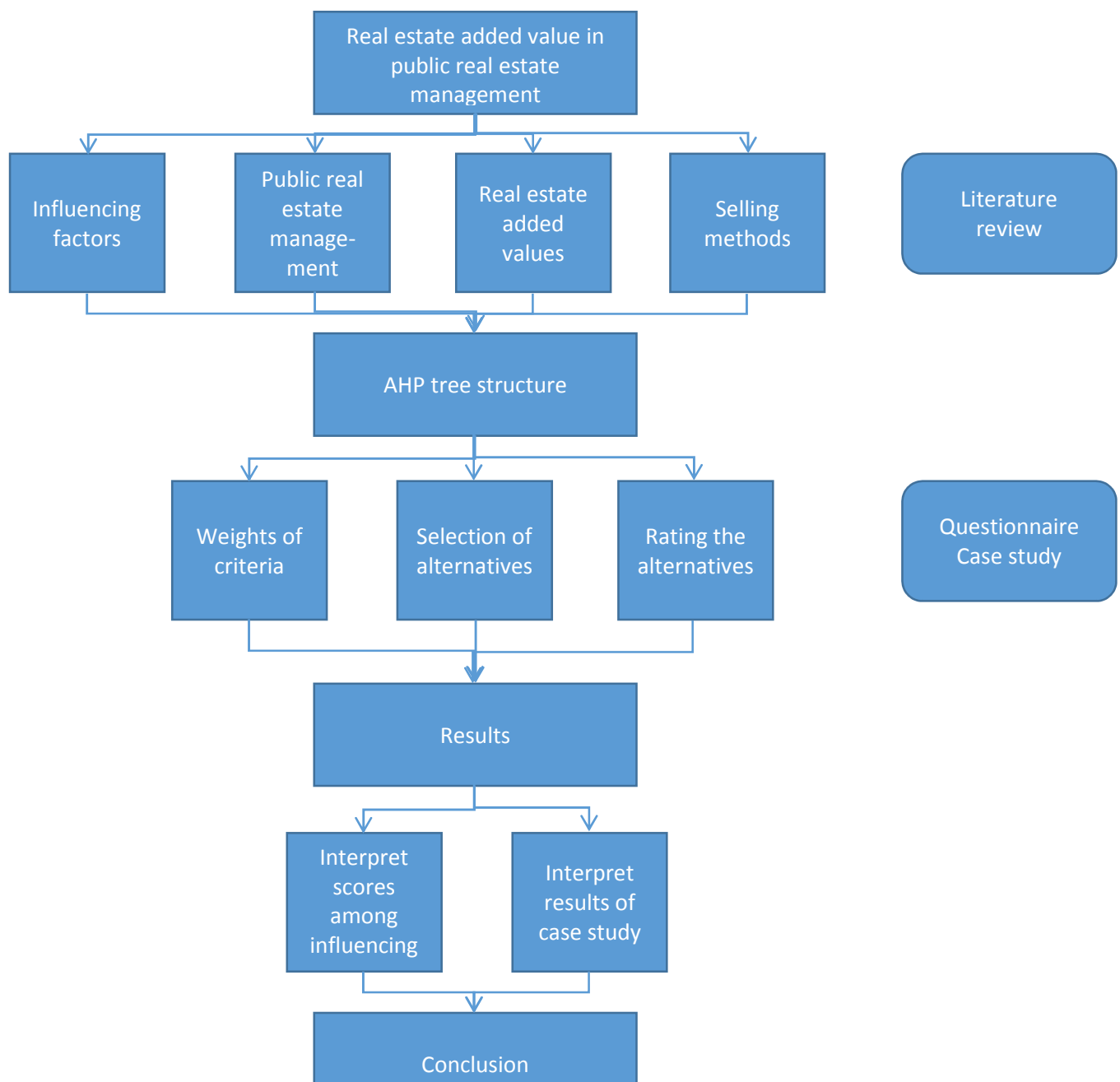


Figure 3: Research design

1.4. Expected results

Not every municipality is the same and has therefore different preferences when it comes to determining the added value of real estate. With this research study a decision support tool will be designed which helps a specific municipality to determine the added value of real estate for their municipality. Taking into account that not solely the monetary value represents the real estate object but also the value the real estate object contributes to the goals and policy of that municipality. If a real estate object does not contribute significant value to the municipal organization, the municipality can decide to sell the real estate object. Using the scores from the AHP method when rating the real estate objects and the marketability of the real estate object will lead to a recommended selling method which suits that object and its context the best.

1.5. Relevance

1.5.1. Societal relevance

Since many municipalities are shifting towards a more lean operation where they only execute their core tasks, municipalities will decrease the number of real estate objects in their real estate portfolio. Since this process has a significant impact on the way the municipality operates and accommodates all of their activities, well thought-out decisions need to be made on whether to keep a real estate object within their real estate portfolio or not. More insight in this topic as well as a decision support tool can help the different municipalities in the Netherlands with this practical problem in finding the value a particular real estate object adds to a specific municipality. This support tool will therefore provide guidance in making well thought through decisions on downsizing the real estate portfolio.

1.5.2. Scientific relevance

Public real estate management is a topic which has evolved rapidly over the past decade. In the Netherlands the awareness of public real estate management, and the added value it can create for the organization, started in the beginning of this century (21st century). Multiple research articles, promotional theses, and master theses have been conducted in the past fifteen years towards public real estate management and social real estate. However the connection between corporate/public real estate management and real estate added values is rather new. This research study will contribute in creating more clearance in the connection between these two areas of study. The follow up step on making these added values measurable and put them into practice has barely been examined. The case study in this research will examine the practical sight of these fields of study. Therefore this master thesis will be an extent of the conducted researches towards public real estate and public real estate management.

1.6. Reading guide

This first chapter discussed the problem statement this research study deals with and the research question derived from that. The second chapter, the glossary, will enlighten the most important definitions used in this report. The definition of real estate and social real estate will be looked into as well as the main principles of a municipality. Some background information on corporate and public real estate management will be provided as well. The

third chapter will provide a thorough literature review on factors influencing the decision behavior, public real estate management, the added value of real estate, and selling methods for public real estate. This literature review will conclude in answering three of the sub questions as defined in this chapter. Different research studies and scientific articles concerning these topics will be discussed and compared to provide a proper insight in the topics and the researches that has been performed in this field. The fourth chapter will cover the research model. Its method, the retrieved data, the processing of the data as well as the discussion on this data. Next to the data analysis and the conduction of the AHP research method a case study will be performed to validate the decision support tool designed in this research study. In the final chapter a conclusion and discussion is given on the main research question, the societal relevance as well as the scientific relevance and the beneficiary relevance.

2. Glossary

2.1. Introduction

In this chapter an overview is given of the different definitions that are applicable on this research study. These definitions will provide the background on which this research study is performed. Throughout this entire thesis definitions will be used as discussed in this chapter.

2.2. Municipal organization

The Netherlands are governed by a government which is layered in several levels. The level which is locally operable are the municipalities. In the Netherlands there are 393 municipalities (“CBS - Gemeentelijke indeling op 1 januari 2015,” n.d.).

An organizational structure is a tool to achieve an effective working method and combining the different parts of the organization with each other. An organizational structure can be seen as a complicated network of agreements concerning the coordination between parts of the organization, the types of relationships between the different parts, the work activities, load balancing, and the communication structures of knowledge transferring (Kuijten, 2010; Keuning, 2007).

A municipality is led by the municipal executive (Koninkrijksrelaties, n.d.). This municipal executive consists of several aldermen (depending on the size of the municipality) and a mayor. The mayor is the head of the municipal executive and the municipal council. This municipal council is elected every four years by the residents of the particular municipality. The aldermen are on their turn chosen by the municipal council, they will each have their own tasks they take care of. The mayor however is not elected via the residents but is put forward by the King’s commissioner and is appointed by the king and the national government. The mayor and aldermen together form the municipal executive which takes care of executing the daily tasks as well as the strategy the municipality has obtained. However, before the municipal executive can make changes they need to address the municipal council for approval in order to execute a particular change.

The organization structure that is commonly used nowadays within municipalities is called a flipped direction model as shown in figure 4 (Aardema & Korsten, 2009). On top of this structure is the formal structure consisting of the municipal council and the municipal executive, which consists of the mayor and the aldermen. Each one of these aldermen is in charge of the different departments that are present in that particular municipality. Every alderman has a team of experts at his order that works for the all of the individual departments.

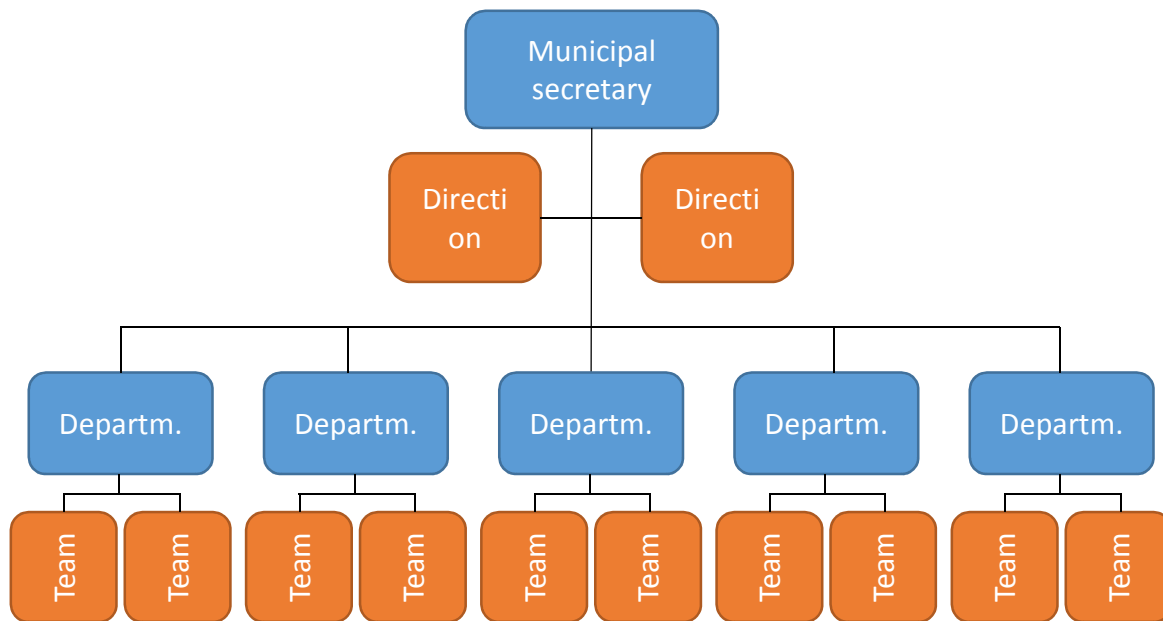


Figure 4 Flipped direction model (Aardema & Korsten, 2009)

Municipalities can define their own policy to a certain extent, however there are several basic obligations a municipality has to live up to according to the Dutch Government. There are some administrative obligations, and the handling the legal documents of the local residents. Another main task of the municipality is regulating and organizing the built environment of the municipality. The municipality makes zoning plans for building sites and real estate objects putting restrictions on these areas concerning function and physical boundaries. The public space in between the private domains are the responsibility of the municipality as well. They are in charge of facilitating proper infrastructure which fulfills to several standards. The last major responsibility of the municipality is providing and facilitating in education, culture, sports and other social welfare activities (“Taken van een gemeente | Gemeenten | Rijksoverheid.nl,” n.d.).

2.3. Real estate

When looking into the definition of real estate, Collins dictionary gives the term real property. Real property is ‘immovable property, esp. land and buildings, including proprietary rights over land, such as mineral rights’ (“Definition of ‘real property’ | Collins English Dictionary,” n.d.). Collins dictionary makes a clear distinction between real property and personal property where personal property is ‘movable property, such as furniture or money’ (“Definition of ‘personal property’ | Collins English Dictionary,” n.d.).

James Graaskamp looks into the definition of real estate as well in his article ‘fundamentals of real estate’. According to Graaskamp ‘real estate can be defined generally as space delineated by man, relative to a fixed geography, intended to contain an activity for a specific period of time’ (Graaskamp, 1981). In addition to this he states that ‘to the three dimensions of space (length, width, and height), then, real estate has a fourth dimension – time for possession and benefit’ (Graaskamp, 1981).

Wade Gaddy jr. and Robert Hart discuss in their book the basics of real estate (Gaddy & Hart, 2003). They define real estate as a term that is ‘broader than the term land and includes not only physical components of the land as provided by nature, but also anything that is

permanently affixed to the land by either natural or artificial attachment' (Gaddy & Hart, 2003). Next to the physical ownership of real property there are several rights and interests that the owner is obliged to. Gaddy and Hart defined five different types of rights included in the ownership of real property: possession, control within the framework of the law, enjoyment in any legal manner, exclusion, and disposition (Gaddy & Hart, 2003). Concluding, a real estate object is the total of the object, the land it is attached to and the rights that come with it.

2.3.1. Social real estate

The organization 'Bouwstenen voor sociaal' states on their website that social real estate is a definition for a real estate object or real estate area that serves a public function in the field of: education, sports, culture, welfare, social shelter, and/or healthcare ("Maatschappelijk vastgoed | Bouwstenen voor Sociaal," n.d.). The definition of social real estate arises in 2005 from the awareness that this type of real estate is used inefficient and managed unprofessionally ("Maatschappelijk vastgoed | Bouwstenen voor Sociaal," n.d.).

Marc van Leent states in his research for 'Kennisplatform Maatschappelijk Ondernemen' (Expertise platform Social Entrepreneurship) that social real estate is real estate 'which is required for social facilities and activities contributing to livable and vital areas and neighborhoods (Van Leent, 2007). He states that this definition is rather broad and social real estate is commonly used for facilitating healthcare, well-being, education, social accommodation, safety, sports, culture, etcetera (Van Leent, 2007).

Pelikaan gives in his research the definition for social real estate: 'the surface and the durable united objects, property of the municipality, for the purpose of facilitating corporations that are present in the society and acknowledged by the municipality as required facilities' (de Kort, 2007; Pelikaan, 2003). Hans De Jonge (2010) states the following: 'social real estate is real estate which can be seen as a goal on itself and is not used to achieve a financial yield on the investment' (Kuijten, 2010; De Jonge, 2010). Over the years the definition of social real estate has developed. In contradiction to the statement of Pelikaan there are more organizations active in the social real estate market aside from municipalities, e.g. housing corporations.

For this research study the definition from De Jonge will be used: 'social real estate is real estate which can be seen as a goal on itself and is not used to achieve a financial yield on the investment' (Kuijten, 2010; De Jonge, 2010)

2.3.2. Public real estate

Public real estate is the real estate which is owned by the government. In the case of this research study this results in the definition that public real estate is all the real estate which is owned by the municipality, either it may be for the accommodation of the direct municipal activities, the housing of social activities of the municipality, strategic real estate that contribute in (area) development or any other real estate which is in the real estate portfolio of the municipality (Kuijten, 2010), (Alma, 2008), and (de Kort, 2007). A schematic overview of the situation is depicted below in figure 5. As can be seen in this figure there is an overlap between social real estate and public real estate, this is the social real estate which is owned by the municipality and other governmental organizations (note: this is a schematic overview and does not say anything about the sizes of these markets)

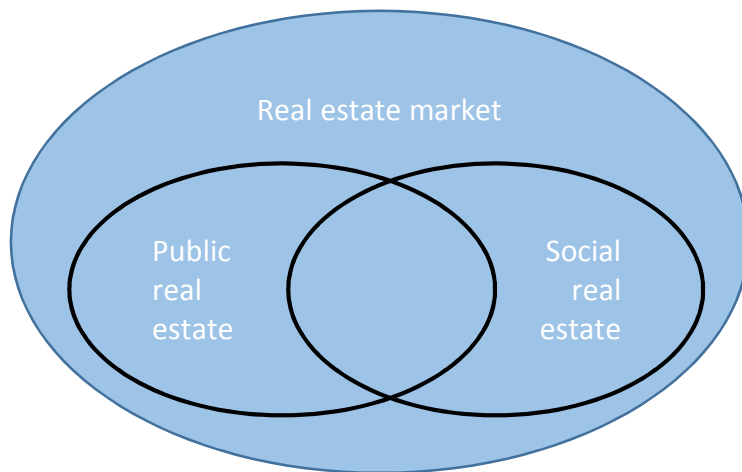


Figure 5: Schematic overview of social and public real estate in the real estate market

2.3.3. Commercial real estate

Commercial real estate is real estate that can be seen as an investment. There are four main property types within the field of commercial real estate: Apartments, Industrial real estate, office real estate and retail real estate (Chinloy, 2013)

2.3.4. Corporate real estate

Corporate Real Estate refers to the land and buildings owned by companies which are not primarily active in the real estate investing market but are investing in their real estate for operational purpose of the organization (Musa & Baharum, 2012; Kim and Joseph, 2004). In essence this is real estate owned by any type of corporation and used for their own activities.

2.4. Real estate management

Real estate management concerns the management of real estate from operational level up to strategic level and all of the activities that come with this (Kuijten, 2010; van Driel, 2007; Gool, Brounen, Jager, & Weisz, 2007). The activities are focused on fitting the real estate into the companies' goals and activities.

2.4.1. Real estate portfolio

Dewulf et al. define a real estate portfolio and the management of this portfolio in the following way: 'optimizing the combination of the building stock by adjusting demand and supply onto each other, taking into account the general governmental policy, the primary process of the end-user, and the costs that are used for the solution' (Dewulf, Den Heijer, De Puy, & Van der Schaaf, 1999).

A clear distinction can be made between two groups of real estate owners; the corporations that use the real estate for their own organization and the corporations that use real estate as an investment to realize a profit margin on. This second group is mainly active in the commercial real estate market (e.g. pension funds or other real estate investment funds). They use several arguments to invest in real estate (Hudson-Wilson, Gordon, Fabozzi, Anson, & Giliberto, 2005):

- To reduce the overall risk of the investment portfolio (e.g. stocks or loans) by combining asset classes that respond differently to expected and unexpected events.
- To achieve an absolute return competitive with other asset classes.
- To hedge against unexpected inflation.
- To constitute a part of a portfolio that is a reasonable reflection of the overall investment universe (an indexed, or market-neutral portfolio).
- To deliver strong cash flows to the portfolio.

In this research study the real estate portfolio of the municipality will be discussed. As stated before, this real estate portfolio can contain a broad set of real estate objects varying from for example a city council, a museum, a school, or other municipal real estate objects.

2.4.2. Corporate real estate management

The real estate of a corporation is a part of the firm' infrastructure needed to fulfill the core businesses (processes). Therefore, real estate is a support activity which has to add value to the business as can be seen in figure 6. In the porter value added chain there are multiple activities which can be categorized as a support activity. The goal of these activities is to support the primary activities of a corporation at its best ("Porter's Value Chain • BusinessSetFree.com," n.d.). Managing each individual support activity carefully could help improve the primary activities. Therefore, a proper real estate management can contribute significantly to the primary activities and can therefore indirectly increase the margin of the corporation.

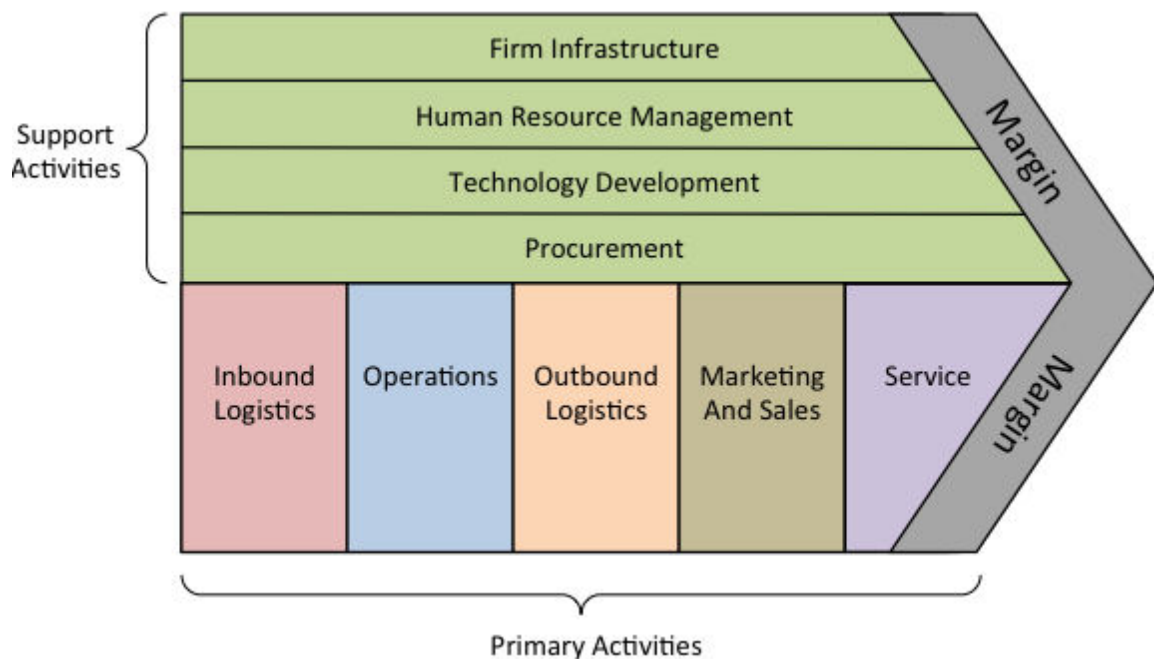


Figure 6: Porter Value added chain ("Porter's Value Chain • BusinessSetFree.com," n.d.)

A commonly used distinction in managerial levels are the levels as depicted in figure 7. These three managerial levels are widely used in the context of real estate management. The first level on top of the pyramid is the strategic level (A), on this level decisions are made concerning the total real estate portfolio and a long term plan is made. On the second level, the tactical level (B), performance analysis of the individual objects in the portfolio are made as well as activities like acquiring new real estate object and (re)development of real estate.

The lowest level, the operational level (C), concerns activities such as property management, park management, and facility management (Prins & Veuger, 2012). As can be seen, major decisions that influence the long term direction of the organization are made on strategic managerial level. On operational level decision are made that influence the here and now, the short term effects.

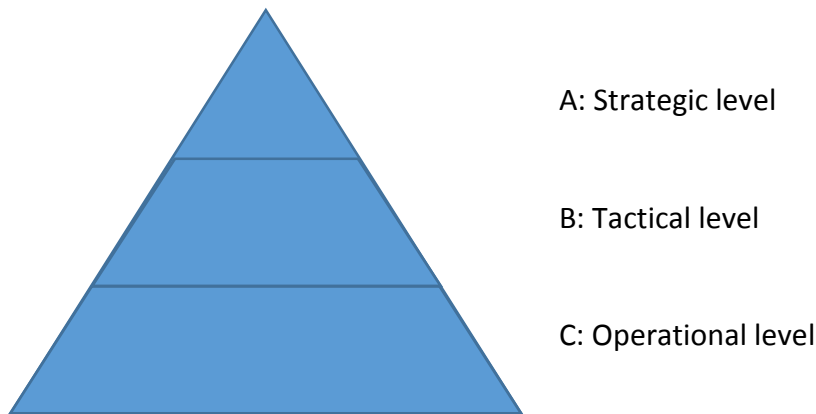


Figure 7: levels of managerial processes (Prins & Veuger, 2012)

Summarized, corporate real estate management can be defined as managing the real estate portfolio of a corporation by adjusting the real estate portfolio and the services on the demands of the core business and its primary processes, in order to achieve the maximum added value for the business to contribute to the overall performance of the enterprise. (Dewulf, Krumm, & de Jonge, 2000)

2.4.3. Public real estate management

Public real estate management is closely related to corporate real estate management. In basic this concerns the management of the real estate portfolio owned by a public organization, e.g. the Rijksgebouwendienst or a municipality (Dewulf et al., 1999).

2.5. Value

Value

Value is a concept of a product or service that is desired by one. The following definition is given by Collins Dictionary: 'The desirability of a thing, often in respect of some property such as usefulness or exchangeability; worth, merit, or importance' ("Definition of 'value' | Collins English Dictionary," 2015).

Monetary value

Monetary value is the ability to turn value into monetary terms. In other words what one is willing to pay for something this person values.

Social value

Social value can be defined as a 'larger concept which includes social capital as well as the subjective aspects of the citizens' well-being, such as their ability to participate in making decisions that affect them' ("What is social value? Business Dictionary," 2015).

Marketability of real estate

The marketability of a real estate object is determined by three indicators (van der Geert, 2006):

- The specificity of the real estate object (e.g. more specific leads to a lower marketability)
- The saleability of the real estate object (e.g. can it easily be transferred from one owner to the new owner)
- The amount of referential transactions (e.g. more referential transactions means a higher marketability)

3. Literature review

Abstract

Municipalities are facing the task to look at their own real estate in a more critical way. Many conducted researches and literature studies on public real estate management and on how real estate can add value to your organization are available. However, to have an overview an analysis of this available literature is made in this literature review. Public real estate management is closely related to corporate real estate management. Three perspectives can be identified in public real estate management; user perspective, strategic perspective, and financial perspective. Within these three perspectives nine added values of public real estate were defined. This set of perspectives and added values will determine the added value of real estate to the municipal organization and considerations of the municipality as follow up actions for this object. Therefore, the selling methods are discussed and placed in a matrix of marketability vs. added value to establish which selling method should be applied upon which surplus real estate object.

Keywords: Real estate added values, corporate real estate management, public real estate management, real estate selling methods, factors influencing decision behavior.

3.1. Introduction

‘The municipalities in the Netherlands altogether own 42 million square meters of social real estate, half of the total supply of real estate. [...] 25% to 50% of this supply – 83,5 million square meters in total - will become vacant in the coming ten to twenty years’ (van Bentum, 2014). Aalbers et al. acknowledge this alteration in the real estate market. They state that municipalities can reduce their costs and spending budget significantly when managing the real estate portfolio more carefully and sell the surplus real estate from the real estate portfolio (Aalbers & Heijnders, 2013). Teuben mentions in his research article that Dutch municipalities should diminish their real estate portfolio significantly since many private companies are able to manage those real estate objects better than the municipalities (Teuben, 2011). The Dutch government and the Rijksvastgoedbedrijf, the governmental company who is responsible for the entire real estate portfolio of the Dutch national government, has obtained the strategy of downsizing the governmental organization and therefore downsizing the real estate portfolio of the Dutch government as well.

This literature review looks into the available literature in this field of study. First an analysis is made of factors that might influence the decision behavior for municipalities in their real estate related decisions. Thereafter, the differences between corporate real estate management and public real estate management will be enlightened. Subsequently the added value of real estate to a municipal organization will be discussed and defined. The last part of this literature review will look into available selling methods in the public domain and their application in surplus municipal real estate.

The conclusions of the different parts of this literature review will lead to the answers to the following sub questions as stated in the first chapter:

- *Which criteria determine the added value of real estate to the municipal organization?*
- *Which selling strategies are there for public organizations to assure a satisfying balance between profit and influence?*

- *How do these selling strategies differ from each other and how can they be applied upon a real estate object?*

These sub questions and their answers will be discussed in the final paragraph in this literature review.

3.2. Factors influencing the decision behavior

Several factors can influence the decision behavior. However, there are several issues which need to be taken into account when defining these factors. It must be possible to make a clear distinction between groups within the factor in order to find major changes. The data on these groups needs to be available in order to make a proper distinction. First the basic characteristics of a municipality are discussed after which the various types of real estate will be discussed.

3.2.1. Municipality

Deloitte describes in their research report that most of the Dutch municipalities, as well as most of the other western European municipalities, are shifting towards a more professionalized and centralized real estate department (Loozen & Zijlstra, 2011). In this new structure the real estate department will be responsible for the administration of the entire real estate portfolio of the municipality. In some cases the real estate department is responsible for the financial part of the real estate as well. The real estate objects are placed on the balance sheet of this department and the profits and losses are therefore their responsibility.

In the article 'gemeenten brengen hun vastgoed onder in professionele organisaties' from De Wit in the 'vastgoedmarkt' the author states that approximately 38% of the municipalities claimed to have a central real estate department within their organization at that moment (De Wit, 2007a). Almost every municipality that did not have a centralized real estate management at that time said they would conduct such an organization in the coming one to three years. In figure 8 there are the two types of organizational structures displayed. As can be seen in the 'old' structure every department was responsible for their own real estate, in the 'new' structure on the right there is a separate real estate department which manages the real estate of all the other departments within the municipality.

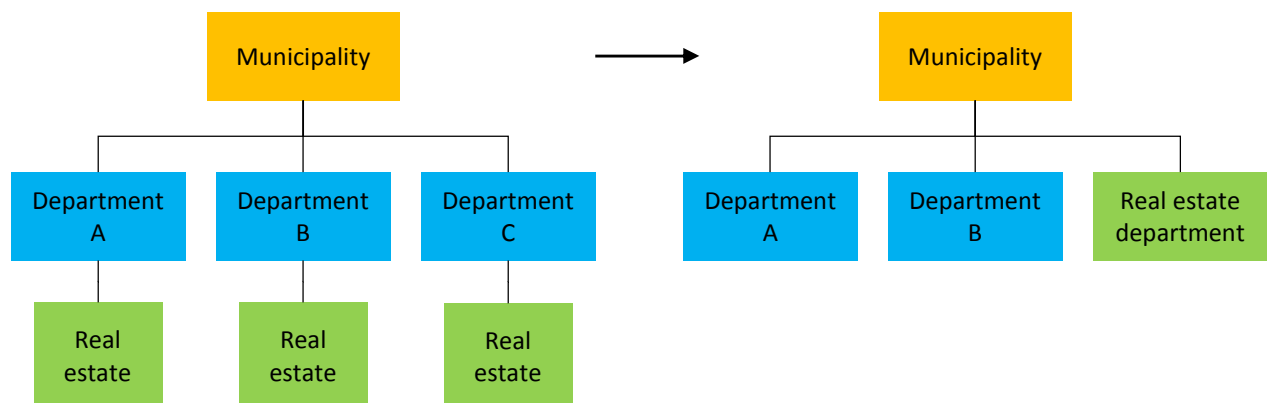


Figure 8: Real estate organization structure. Left the decentralized structure and right the centralized structure

This centralization process should contribute to a clearer overview of the total real estate portfolio. Therefore the municipality should be able to make better long term decisions that

inflict the real estate portfolio of the municipality. An organization can take it to an even higher level by setting up an individual company that manages the real estate for its organization. The national government of the Netherlands obtained such a structure, where they have one real estate company (Rijksvastgoedbedrijf; National Real Estate Company) which is in charge of the accommodation of all of the ministries and other governmental buildings ("Rijksvastgoedbedrijf, Onze speerpunten," 2015). On the website of Rijksvastgoedbedrijf they have formulated a strategy towards the future where they state the national government is shrinking due to budget cuts and therefore the need of real estate for the government will decrease.

Where Deloitte described a specific real estate department within the organization of the municipality (Loozen & Zijlstra, 2011) a third type of organization could be as adopted by the Dutch government. The Rijksvastgoedbedrijf is a company which is standing on itself and has one shareholder, the Dutch government. It is likely to assume that these three different types of organization structures (decentralized structure, real estate department, and real estate company) are managing their real estate portfolio in a different way. Where the real estate company will probably have a stronger focus on the long term vision and operate on a strategic level the decentralized structure will probably focus more on operational level and therefore make more short term decisions. To find these differences in focus points this categorization is made and examined among different municipalities. In conclusion one can state that, in general, there are three types of organization structures being used at the moment when looking towards the public real estate management.

1. The decentralized structure, where every department is in charge of their own real estate portfolio
2. The real estate department, where the entire real estate portfolio is placed within the responsibility of one department within the municipality.
3. The real estate company, where an organization, apart from the municipality, is the owner and administrator of the real estate portfolio.

Depending on the strategy of the municipality the real estate department or real estate company will be responsible for the real estate portfolio on different kind of levels, operational, tactical and/or strategic.

Next to the organizational structure as influencing factor on the decision behavior, there are two other major characteristics of a municipality that might influence the decision behavior. The size of the municipality could influence the decisions made around real estate. Teuben states in his research that in general the bigger the municipality, the bigger its real estate portfolio (Teuben, 2011). Another characteristic that might influence the long term strategy and portfolio management is the forecasted demographic transition in a region. Jager and Naus acknowledge that there are different policies for municipalities that differ both in size and growth of the region (in terms of inhabitants) (e.g. the Randstad, region Rotterdam, Amsterdam, and the Hague) (Jager & Naus, 2012).

The size of a municipality determines for a large share the size of the real estate portfolio. When the real estate portfolio becomes bigger the real estate management department will be able to adapt more easily to changing environments than a relatively small municipality. A municipality that is coping with a relatively large demographic transition (shrinkage or strong growth) needs to adjust their real estate portfolio to these changing environment in order to maintain a proper real estate portfolio.

To create a distinction between the different sizes of municipalities the municipalities will be categorized into different categories which is applied by the CBS as can be seen in table 1 (Centraal Bureau voor de Statistiek; central bureau for statistics) (“CBS StatLine - Gemeentelijke afvalstoffen; hoeveelheden,” 2015). However, the first two groups, less than 5000 and 5000 – 10.000, contain respectively 6 municipalities and 27 municipalities. Since these two groups are relatively small these will be merged with the group 10.000 – 20.000 into less than 20.000. This way there are four remaining categories which will be used in this research study as can be seen in the two columns on the right in table 1.

Table 1: Categorization of sizes of municipalities by CBS (“CBS StatLine - Gemeentelijke afvalstoffen; hoeveelheden,” 2015)

Group	# municipalities	Group	# municipalities
Less than 5.000 inhabitants	6	-	-
5.000 - 10.000 inhabitants	27	-	-
10.000 - 20.000 inhabitants	94	Less than 20.000 inhabitants	127
20.000 - 50.000 inhabitants	192	20.000 - 50.000 inhabitants	192
50.000 - 100.000 inhabitants	44	50.000 - 100.000 inhabitants	44
More than 100.000 inhabitants	30	More than 100.000 inhabitants	30

To make a distinction into categories on the demographic transition the population growth of a municipality will be compared with the average population growth of the Netherlands. This results in two groups, above and below average. An additional group is added which contains municipalities that will be dealing with a decline in population growth, the so called shrinkage regions. The estimated population growth in the Netherlands over a time span of 10 years (2015-2025) is 3,4% (“PEARL Light,” 2015), this results in the following three categories:

- Shrinkage < 0% (152 municipalities)
- Small growth 0% - 3,4% (129 municipalities)
- Strong growth > 3,4% (109 municipalities)

3.2.2. Types of real estate

The variety of types of real estate objects within the real estate portfolios of municipalities is relatively large compared to other real estate portfolio holders (van den Bergh, 2011; (Korsten, Ter Braak, & Van 't Spijker, 1993). Therefore, it is likely to assume that not every real estate object is dealt with in the same way. Every object adds value to the municipal organization in a different way. To structure the real estate from the municipality in a comprehensive structure three cases are being studied after which five categories are defined. The municipality of Beuningen uses four categories to classify their real estate objects (Willems, 2013):

- Primary real estate (used for own activities)
- Secondary real estate (social real estate)
- Strategic real estate (used for area (re)development)
- Other real estate

The first category, primary real estate, is defined as follows: next to ownership and lessor, the municipality uses real estate objects for their own activities as well (e.g. city office and a municipal waste disposal) (Willems, 2013). The second category can be characterized as social

real estate. This category is subdivided into three subcategories; Education, Sports, and Welfare, Health & Youth. The majority of educational buildings are schools, primary and secondary schools. Although, the ownership lies sometimes in between the municipality and the board of the school itself, the municipality owns in general all of the schools in their municipality. The second subcategory is Sports, those are all real estate objects and surfaces that contain a sports activity. The municipality sees it as an obligation to their inhabitants to facilitate these functions. Examples of real estate objects in this category are, football fields, a swimming pool, and a sports hall. The third subcategory contains real estate objects such as a library, scout boys facility, and a music practicing accommodation. The third category, strategic real estate, contains objects that are being used for new area (re)development. This contains objects that became vacant over time and have a strategic location within the municipality. The municipality can decide to obtain the object and redevelop the object in order to create a livable surrounding area (e.g. an obsolete and vacant real estate object on a strategic location).

The remainder category is defined 'other real estate'. This category contains two types of real estate: non-functional real estate objects and semi-social real estate objects. Non-functional objects are for example monumental objects that the municipality wishes to preserve but cannot be used for any activities that create a turnover. Semi-social real estate objects are objects that accommodate in essence social activities, however the turnover and profit made in these objects are shifting towards commercial activities. Therefore, the question mark is placed whether the municipality should have this in its portfolio or that it should be sold to a private organization (e.g. Child day care service, or parking lots).

The municipality of Rotterdam uses solely three categories to categorize their real estate portfolio (Verspui, 2014):

- Social real estate
- Commercial real estate
- Exceptional real estate

The first category is defined as real estate supporting the tasks of the municipality, this considers both the direct services the municipality offers (e.g. city office) as well as social activities as education, sports, and well-being. The second category is commercial real estate, these are objects that accommodate private organizations which pursue a certain profit (parking lots and shops). The third category contains real estate objects that each need an individual approach, this is strategic real estate and other real estate (objects used for area (re)development and monumental objects).

The municipality of Utrechtse heuvelrug uses five categories to define their real estate portfolio (de Brey, 2012):

- Own activities (offices that accommodate the municipal organization)
- Social real estate (Schools, libraries, sports hall, community center)
- Commercial real estate/strategic real estate (Real estate for the use of future developments)
- Public space related real estate (monuments, parking lots, parks)
- Other real estate (houses, and individual parking garages)

These five categories show some overlap with the categories mentioned above for the municipalities of Rotterdam and Beuningen and will not be further discussed.

In the table below, table 2, an overview is given on the various categories obtained by the three municipalities discussed in this subparagraph. The categories show much overlap and the differences will be discussed below.

Table 2: Overview of categorization of real estate portfolios of municipalities

municipality	author	own activities real estate	social real estate	commercial real estate	strategic real estate	other real estate
Beuningen	Willems (2013)	<i>Primary real estate</i>	<i>Secondary real estate</i>	<i>Other real estate</i>	<i>Strategic real estate</i>	<i>Other real estate</i>
Rotterdam	Verspui (2014)	<i>Social real estate</i>	<i>Social real estate</i>	<i>Commercial real estate</i>	<i>Exceptional real estate</i>	<i>Exceptional real estate</i>
Utrechtse Heuvelrug	De Brey (2012)	<i>The public services</i>	<i>Social real estate</i>	<i>Commercial/strategic real estate</i>	<i>Commercial/strategic real estate</i>	<i>Public space related objects & Other real estate</i>

The following five categories (as mentioned in table 2) derive from these three cases discussed above and are therefore being used for this research study:

- Real estate that facilitates the own direct activities
- Social real estate
- Commercial real estate
- Strategic real estate
- Other real estate

However, as can be seen from the explanation of the categories by each individual municipality the fourth and the fifth category (strategic real estate and other real estate) are real estate objects which are quite unique or have a rather unique context. Other real estate objects are often not even actual buildings but are objects that serve the public space, e.g. an art object. Strategic real estate objects can be quite diverse and the municipality has a special plan in mind with these particular objects and are therefore not managed on a daily basis. Often these real estate objects are managed by a different department (e.g. development department or ground company) than the real estate department (Willems, 2013), (Verspui, 2014), (de Brey, 2012). The categories strategic real estate and other real estate are therefore being left out of the scope of this research study for these reasons. Therefore the remainder three types of real estate will be taken into account in this research study:

- Real estate that facilitates the own direct activities
- Social real estate
- Commercial real estate

3.2.3. Conclusion

There are different factors that influence the decision behavior of the various municipalities in the Netherlands. There are four factors defined which will be taken into account in this research study.

- The organization structure of the municipality
- The size of the municipality
- The demographic transition of the municipality in the coming years
- The type of real estate that is being dealt with

In the literature review three different types of organizational structures are defined and stated below:

- Real estate company (e.g. one company apart from the organization which is responsible for the entire real estate portfolio in different managerial levels)
- Centralized real estate department (e.g. one specific department within the organization which is responsible for the entire real estate portfolio)
- Decentralized real estate department (e.g. when the educational department is responsible for all the school buildings)

The size of the municipality has a direct relation with the size of the real estate portfolio. When the real estate portfolio becomes larger, different possibilities arise. The formulated categories within this factor are:

- Small: < 20.000 inhabitants
- Medium small: 20.000 – 50.000 inhabitants
- Medium large: 50.000 – 100.000 inhabitants
- Large: 100.000 < inhabitants

The demographic transition might have an influencing factor as well on the decision behavior. The categories within this factor are as follows:

- Shrinkage: < 0%
- Growth below national average: 0% - 3,4%
- Growth above national average: > 3,4%

The final factor that might affect the added values of real estate is the type of real estate being dealt with. Initially five categories were defined. However, two categories, strategic real estate and other real estate, are left out of the scope of this research study due to the uniqueness of the object or its situation. The three categories taken into account in this research study are:

- Real estate used for own direct services
- Social real estate
- Commercial real estate

3.3. Real estate management

Real estate management concerns the management of real estate from operational level up to strategic level and all of the activities that come with this (Kuijten, 2010; van Driel, 2007; Gool, Brounen, Jager, & Weisz, 2007). The activities are focused on fitting the real estate into the companies' goals and activities.

Public real estate management and corporate real estate management are quite similar. In this paragraph the differences and similarities are discussed in order to form a clear description of public real estate management. As mentioned in second chapter by the porter model real estate activities are supporting activities and if managed carefully it can add value to the primary processes of the organization ("Porter's Value Chain • BusinessSetFree.com," n.d.). In the table beneath, table 3, an overview is given on the available literature on real estate management. In this table there are four perspectives given which are being discussed by the researchers (user, strategic, financial, and physical perspective). Every researcher used other terms to define these perspectives. First corporate real estate management is described

and after that public real estate management is discussed. In the conclusion a comparison between these two lead to definition of public real estate management.

Table 3: Overview of available literature on corporate and public real estate management

Researcher	Year	Corporate/Public	User	Strategic	Financial	Physical
De Jonge	1997	Corporate	Facility management	General management	Asset management	Project management
Dewulf et al.	1999	Public	Users	National Government	Ministry of Finance	-
Dewulf et al.	2000	Corporate	Facility management	General management	Asset management	Project management
Van der Schaaf	2002	Public	Users	Government	Treasury	-
Den Heijer	2011	Semi public	Functional	Strategic	Financial	Physical
Teuben	2011	Public	functional considerations	governmental considerations	financial-economic considerations	ideological considerations

3.3.1. Corporate real estate management

Dewulf, Krumm, and de Jonge discuss in their book ‘successful corporate real estate strategies’ the meaning of real estate for a corporation and the added value it can realize for the corporation (Dewulf et al., 2000). They use the following definition to define corporate real estate management: ‘the management of a corporation’s real estate portfolio by aligning the portfolio and services to the needs of the core business (processes), in order to obtain maximum added value for the businesses and to contribute optimally to the overall performance of the corporation’ (Dewulf et al., 2000).

This definition refers to the notion that real estate can add value to the overall corporate performance, or in other words, that real estate has an added value. Different authors have addressed possible added values of real estate which will be discussed in paragraph 3.4 (Van der Zwart, 2011; Van der Voordt & Van der Zwart, 2011).

De Jonge drafted a model to align two different axis; the focus level of the organization towards the real estate (horizontal axis) and the policy level of how the real estate is approached (vertical axis).

This resulted in the figure as depicted below, figure 9, this is an interpretation of the model from De Jonge and Den Heijer. The four quadrants that de Jonge used were defined in the following way (den Heijer, 2011; de Jonge, 1997):

1. General management; here the focus lies on the institutional strategy
2. Asset management; here the focus lies on the available resources
3. Facility management; here the focus lies on the primary process
4. Project management; here the focus lies on spatial and technical aspects

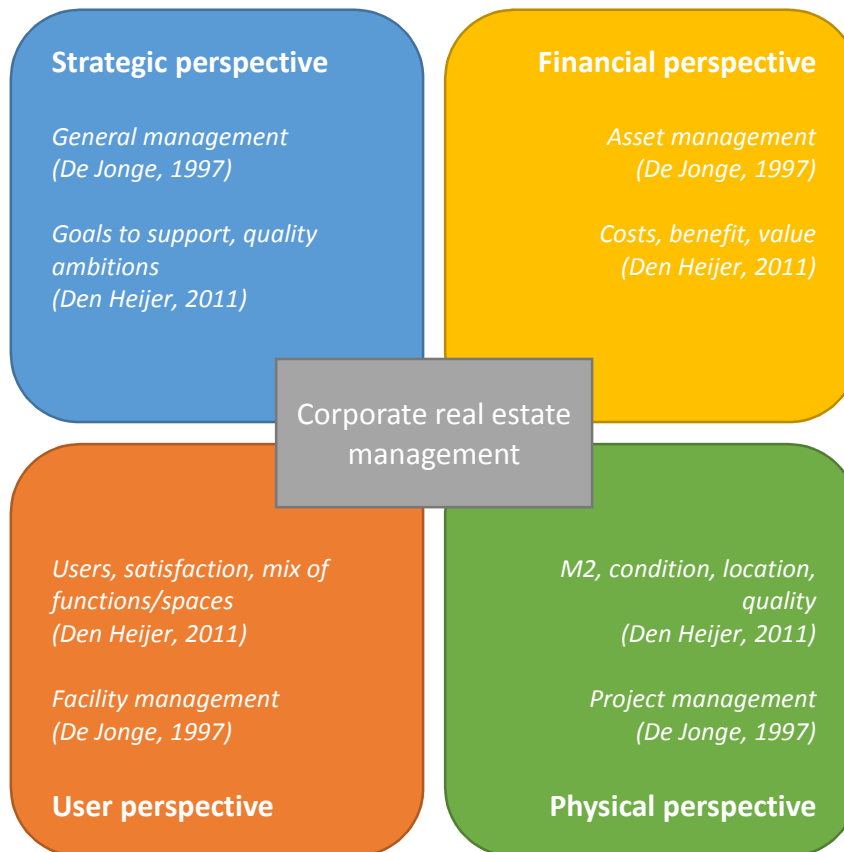


Figure 9: Corporate real estate management model for campus management (den Heijer, 2011)

As stated before, two axis can be identified in this figure, figure 9. On the horizontal axis, the focus is shifting from the process of the organization towards the real estate object. The vertical axis can be defined as two managerial levels; strategic level at the top and operational level at the bottom. According to Dewulf et al. corporate real estate management is merely focused on the bottom half of the figure, however, if a corporation wants their real estate to add value to the corporation a more strategic viewpoint needs to be obtained (Dewulf et al., 2000). Therefore, the term campus management is added to the figure in the middle by Den Heijer. De Jonge used the term 'corporate real estate management' to indicate the required balance between these four quadrants. This figure, figure 9 emphasizes the necessity of a balance between all of these quadrants in order to have a proper corporate real estate management as well (Dewulf et al., 2000). Den Heijer links the four quadrants to the following (groups of) persons that affects it (den Heijer, 2011):

- Strategic: policy makers
- Functional: users
- Financial: controllers
- Physical: technical managers

Policy makers are the persons in an organization that operate on a strategic level, e.g. the board of the organization or business unit. The left bottom quadrant represents the users of the real estate. This can either be the employees of the organization, clients or other users. The financial quadrant represents those persons within the organization that are responsible for the actual real estate and the long term strategy of the real estate (portfolio) of the organization. They make decisions that affect the long term course of the organization, e.g. the redevelopment of a real estate object or purchase of a new real estate object. The last

quadrant, physical, represents the persons that are working with the real estate on operational level, e.g. maintenance workers.

3.3.2. Public real estate management

The definition of public real estate management according to Dewulf et al. is (Dewulf et al., 1999): ‘Optimizing the assembly of building supply by adjusting the supply and demand onto each other, taking the general government policy, the primary processes of the users, and the costs related to the solution into account. In this definition the researchers discuss three main stakeholders on a national level:

- The users of the real estate and their primary processes
- The policy of the national government
- The ministry of finance, which is responsible for the financing of the real estate

In 2002 Pity van der Schaaf promoted on his topic “Public real estate management: challenges for government”. This study looks at the way local governments over the world handle their real estate portfolio. Van der Schaaf mentions three major differences between corporate real estate management and public real estate management (Van der Schaaf, 2002; Evers, Van der Schaaf, & Dewulf, 2002), in public real estate management:

- (Municipal) organizations are non-profit organizations
- Political steering and governance play a major role
- More stakeholders are involved

In the first place, businesses and governments are fundamentally different organizations. Business leaders are driven by the profit motive, where government leaders are driven to serve the society and partially by a motivation to get re-elected (Van der Schaaf, 2002). Businesses get most of their money from their customers, governments get most of their money from tax-payers. Businesses are usually driven by competition, governments are monopolies, since their organization is the only organization which is allowed to collect taxes and obliged to provide several services (e.g. social security). Thus there are fundamentally different incentives in public organizations. They do not normally think about making a return on investment. Governments focus on the cost of government services. The same applies to real estate: politicians might consider the buildings they use less as an investment that should be made profitable than corporate organizations do. Moreover, because of the specific nature of some public buildings, their economic value is often considered to be relatively low or even zero (e.g. a monument with no further function) (Van der Schaaf, 2002).

Second, within public organizations, political steering and governance play a major role. In many public organizations the financial profits – or rather the costs – of real estate are less important than their added value towards the municipal community. The public manager has to consider political goals and policies, as defined by feelings and positions of power, which are measured by continuously changing criteria. Public buildings, therefore, very often have a symbolic meaning and serve purposes quite distinct from their meaning as a workplace for civil servants or as a capital investment (Van der Schaaf, 2002).

The third and last difference is related to the previous point. In addition to the influence of political steering, public real estate managers have to deal with many more external stakeholders than their colleagues in the private sector. Whereas corporations have to listen to shareholders, and, to some extent, the public (as far as they have something to sell to the

public), public organizations often have to deal with a whole regiment of stakeholders such as special committees, various interest groups, the general public, individual members of parliament, etc. With the increase in the number of stakeholders, the boundaries of the playing field in which a public real estate manager has to operate become unclear and more difficult to handle (Van der Schaaf, 2002).

Van der Schaaf identifies three major stakeholders that are present in public real estate management: users, government, and treasury (Van der Schaaf, 2002). He aligns these three stakeholders with the corporate real estate management model from De Jonge (de Jonge, 1997) and states that the user perspective aligns with the physical management, the governmental perspective aligns with the strategic management and the treasury perspective with the financial management quadrant. Dewulf et al. uses these three perspectives as well in describing the three major stakeholders that influence the decision making process (Dewulf et al., 1999). The fourth quadrant as mentioned in the previous sub paragraph, physical, is not represented by a major stakeholder that has a significant influence on the decision making process in comparison with the other three groups of stakeholders; users, policy makers, and treasury. Therefore, this perspective is left out by Dewulf et al. (Dewulf et al., 1999).

Bert Teuben discusses in his article in real estate magazine whether municipalities should own their real estate or rent an accommodation. He considers four different categories in which considerations should take place by the municipality whether to maintain or sell a real estate object from the real estate portfolio. These four categories are (Teuben, 2011): (1) financial-economic considerations (financial perspective), (2) functional considerations (user perspective), (3) governmental considerations (strategic perspective), and (4) ideological considerations. The first three are alike the earlier mentioned perspectives derived from the literature. However, the fourth type of considerations forms an additional perspective from which a municipality might decide to keep a real estate object in the real estate portfolio (Korsten et al., 1993), (Teuben, 2011; Cresswell, Burke, & Pardo, 2006). These ideological considerations discuss the ideological aesthetics or emotional value a real estate object can contain. These ideological considerations can be absorbed in the other three perspectives (user, strategic, and financial perspective) as described by van der Schaaf (Van der Schaaf, 2002) and Dewulff et al. (Dewulf et al., 1999). The consideration of preserving a monumental object might be of strategic value for the municipality in keeping an historic, iconic real estate object in their portfolio and thus in their municipality.

3.3.3. Conclusion

Taking the main deliberation of Dewulf et al. (Dewulf et al., 1999) into account that the following three perspectives are represented by major stakeholders these three perspectives will be used to express public real estate management:

- User perspective: As reasoned from the end user, these are visitors, employees, and other individuals that use the real estate to exploit activities.
- Strategic perspective: This concerns the long term real estate decisions as reasoned from governmental level; should the decision fit in the goals and the vision of the municipality.
- Financial perspective: This perspective takes the available funding into account, the cash flow as well as the overall financial position.

3.4. Added values of real estate

Nourse and Roulac were one of the first researchers to acknowledge that managing real estate with the right strategy can add significant value to the business' operations (Nourse & Roulac, 1993). In the conclusion of their research they state: 'Too often corporate real estate transactions are approached from a predominantly deal-making rather than strategic posture' and that a corporation its 'focus unfortunately is predominantly on economic issues, all too often at the expense of other important strategic priorities' (Nourse & Roulac, 1993). Den Heijer states that 'in theory, every corporate real estate [...] decision can be related to at least one of these goals' (added values) (den Heijer, 2011). After the research study from Nourse & Roulac in 1993 several researchers performed follow up researches by adding or adjusting the defined added values of real estate. Other researchers that performed a research study towards this topic are: De Jonge (1996), Lindholm, Gibler & Leviäinen (2006), Scheffer, Singer & Van Meerwijk (2006), De Vries, De Jonge & Van Der Voordt (2008), Den Heijer (2011), and Van Der Zwart (2011).

'Nourse et al. and Lindholm et al. focus more on real estate strategies and aligning these strategies with the corporate businesses and strategies, the other researchers focus more on the added value of real estate for the corporate businesses and strategies' (Van der Zwart, 2011). The term of added value corresponds with the theory of Porter. Porter states that real estate is a supporting activity which goal is to add as much value to the primary business as possible ("Porter's Value Chain • BusinessSetFree.com," n.d.). The derived added values and strategies from the conducted researches over the past years show similarities and overlap. In table 4 an overview is given, in keywords, of the derived added values or strategies from each different research study. As can be seen in the table several added values are defined in the same way every research study, e.g. cost reduction and flexibility. Over the years several assemblies are made of the added values, De Jonge (1996), and Scheffer et al. (2006) who continued onto De Jonge his study, defined fewer added values than all the others. They use 'Increasing/improving productivity' and 'improving/changing the culture' to represent multiple other added values which the other researchers use. A researcher that uses many different added values is Den Heijer (2011), in total she defined eleven added values where others use less as can be seen in table 4. De Vries et al. (2008) and Van Der Zwart (2011) use more or less the exact same added values as Den Heijer (2011). Den Heijer divided 'improving culture' into 'supporting culture' and 'stimulating collaboration' and divided 'increasing user satisfaction' into 'increasing user satisfaction' and 'quality of place' (den Heijer, 2011).

In this research study the most recent research studies will primarily be used since they have all discussed the other research studies as well. The research study from Den Heijer (Heijer, 2011) and Van Der Zwart (Zwart, 2014) will therefore form the layout of the structure of this paragraph as well. Den Heijer placed every added value within one of the present perspectives. Den Heijer her added values are quite similar to the added values as described by Van Der Zwart the only major difference is the added value 'increasing user satisfaction' and 'improving culture'. Den Heijer opted for splitting these two up in newly formed added values where van der Zwart opted for those two as discussed previously.

The added values that are discussed in the table are all applicable on a different type of real estate. The first researches from Nourse et al., De Jonge, Lindholm et al., and Scheffer et al.

concern corporate real estate (Nourse & Roulac, 1993), (de Jonge, 1996), (Lindholm & Leväinen, 2006), (Scheffer et al., 2006). Where Den Heijer discusses an educational function by applying the added values of real estate on a university campus. De Zwart puts the added values of real estate in context of healthcare by applying it on hospitals and interviewing the real estate managers in this industry (den Heijer, 2011), (Zwart, 2014). However, Municipalities are different in the way they operate and their mission and goals as can be seen in the second chapter and as discussed in the previous paragraph.

Den Heijer and van der Zwart discussed categorizing the added values of real estate into the perspectives active in corporate real estate management and public real estate management (den Heijer, 2011), (Van der Zwart, 2011). Categorizing the nine added values as given in the table into the three derived perspectives from the previous paragraph will result in the following division.

- User perspective: improving productivity, increasing user satisfaction, and improving culture
- Strategic perspective: increasing innovation, improving flexibility, and supporting image
- Financial perspective: reducing costs, controlling risks, and improving the financial position

The added values as defined above will be discussed based on the available literature.

Table 4: List of added values of real estate (Nourse & Roulac, 1993), (De Jonge, 1996), (Lindholm & Leväinen, 2006), (Scheffer et al., 2006), (de Vries et al., 2008), (den Heijer, 2011), and (Van der Zwart, 2011)

		Nourse et al.	De Jonge	Lindholm et al.	Scheffer et al.	De Vries et al.	Den Heijer	Van Der Zwart
		1993	1996	2006	2006	2008	2011	2011
		Real estate strategies	Added values of real estate	Real estate strategies	Added values of real estate	Added values of real estate	Added values of real estate	Added values of real estate
User perspective	Improving productivity	Facilitate and control production, operations, and service delivery	Improve productivity	Increase productivity	Increasing productivity	Increase productivity	Supporting user activities	Improving productivity
	increasing user satisfaction	Promote human resources	x	Increase employee satisfaction	x	Increasing satisfaction	(1) Increasing user satisfaction & (2) quality of place	Increasing user satisfaction
	improving culture	x	Improve culture	x	Changing the culture	Improving culture	(1) Supporting culture & (2) stimulating collaboration	Improving culture
Strategic	increasing innovation	Facilitate managerial process and knowledge work	x	Increase innovation	x	Stimulating innovation	Stimulating innovation	Increasing innovation

	supporting image	(1) Promote sales and selling process & (2) marketing message	Marketing	Promote marketing and sale	PR and marketing	Supporting image	Supporting image	Supporting image
	Improving flexibility	Flexibility	Increase flexibility	Increase flexibility	Increase of flexibility	Enhancing flexibility	Increase flexibility	Improving flexibility
Financial perspective	improving the financial position	Capture real estate value creation	Increase flexibility of finance (increase of value)	Increase value of assets	Increase of value	Expanding funding possibilities	Increase real estate value	Improving the financial position
	controlling risk	x	Risk management	x	Risk control	Controlling risks	Controlling risk	Controlling risk
	Reducing costs	Occupancy cost minimization	Reduce cost	Reduce cost	Cost reduction	Reducing costs	Decreasing costs	Reducing costs

3.4.1. Added values from user perspective

The three added values within the user perspective are improving productivity, increasing user satisfaction, and improving culture. These three added values will be discussed below.

Improving productivity

‘To increase production through a more effective use of real estate’ (Zwart, 2014).

Den Heijer defines this added value by ‘optimally supporting the activities of users’ (den Heijer, 2011). Criteria that contribute in improving the productivity are the ‘selection of location’, ‘innovative workplaces’, and ‘retaining human capital’ according to Scheffer et al. (Scheffer et al., 2006). Lindholm & Leväinen states that improving productivity will lead to an increase of the profitability (Lindholm & Leväinen, 2006). De Jonge defines improving productivity by using ‘real estate as a means of working more efficiently’ (de Jonge, 1996). Lindholm et al. formulated five real estate decisions which can be made on operational level than enhances the productivity of the organization and the employees (Lindholm & Leväinen, 2006).

- Maintain facilities to accommodate optimal operations
- Provide environment that enhances productivity
- Choose convenient layouts and locations for providers
- Design facilities that improve the creation and delivery of products or services
- Choose convenient locations for employees in separate buildings

In conclusion one can state the aim of improving the productivity improves the use of the real estate object in a more efficient way and improving the quality of activities that take place in the real estate object.

Increasing user satisfaction

‘To create functional, pleasant and comfortable places for visitors, consumers and employees’ (Zwart, 2014).

‘Within the corporate real estate this added value is extra important when the business is a knowledge bases business’ (den Heijer, 2011). The employees are the most valuable asset of the organization and therefore the main users of the real estate (Nourse & Roulac, 1993). Attributes that contribute in increasing the user satisfaction are (Lindholm & Leväinen, 2006):

- Seek locations which are convenient to employees (users)
- Provide a pleasant and comfortable working environment
- Provide a functional workplace
- Suffice in desired amenities of the users
- Respond quickly to real estate requests.

User satisfaction is seen as a possibility to enhance the profitability of the organization significantly; many firms in a range of industries have recognized this indirect path to profit (Lindholm et al., 2006). From the perspective of real estate management it is important to react adequate to users’ requests (Van der Zwart, 2011)

In conclusion one can state that the aim of increasing the user satisfaction is to create a functional, pleasant and comfortable environment for users. This concerns the real estate, the surrounding area and the accessibility of the real estate

Improving culture

‘To improve interpersonal relations and communication by real estate’ (Zwart, 2014).

De Jonge (1996) defines improving culture as using real estate as a means of effecting cultural change and improve interpersonal relations. ‘This also relates matching the use of the real estate with the organizational or corporate culture’ (Den Heijer, 2011). Scheffer et al., who performed a follow up research onto De Jonge his research stated that the amount of communication and workplace innovation indicate the performance level of improving the culture (Scheffer et al., 2006). Heijer emphasizes the amount of communication and interaction between users as well and states that specific real estate interventions stimulate ‘encounters between different users or user groups’ (den Heijer, 2011).

The aim of improving the culture is to create a facility where interaction can take place and a culture is being developed where people are being attracted to.

3.4.2. Added values from strategic perspective

The three added values within the strategic perspective are improving flexibility, supporting image, and increasing innovation. These three added values will be discussed below.

Improving flexibility

‘To structure a real estate portfolio in such a way that future spatial, technical, organizational and juridical adjustments are possible’ (Zwart, 2014).

Scheffer et al. distinguishes two types of flexibility: organizational flexibility and financial flexibility (Scheffer et al., 2006). Den Heijer characterizes the organizational flexibility as the ‘flexible use of facilities by many types of users’ (den Heijer, 2011). When an organization obtains this flexibility the organization enables to ‘solve a problem in the real estate portfolio without hindering the primary processes’ (den Heijer, 2011). Den Heijer states that this can

be enabled by assuring the possibility of expanding the real estate object(s) and using more standardized spaces which can be used for multiple functions. Nourse and Roulac interpret this added value by minimizing the occupancy cost, both in the short run as well as doing so in the long run (Nourse & Roulac, 1993). This means that the real estate should function the present. However, every possible real estate intervention in the future should be considered in order to maintain the value of the real estate object. When de Zwart speaks about the long run he mentions that a real estate object should be able to adapt relatively easy to a changing environment over the coming 40 years (Van der Zwart, 2011). Lindholm mentions five measurements that could be considered to improve the flexibility; choose a leasing contract instead of owning the real estate object, negotiate short-term lease contracts, create flexible workspace solutions, favor multiple use facilities (e.g. canteen), and select serviced offers instead of obtaining all of these services within the organization (Lindholm & Leväinen, 2006).

In conclusion one can state that improving the flexibility means that adequate changes are possible when future spatial, technical, organizational and/or juridical changes appear.

Supporting image

‘To express corporate objectives by using real estate as an icon for the organizational culture’ (Zwart, 2014).

Nourse and Roulac distinguish this added value into the following two real estate strategies: ‘Promoting marketing message’ and ‘promote sales and selling processes’ and therefore it can be ‘seen as physical institutional advertising’ (Nourse & Roulac, 1993). De Jonge speaks of marketing when discussing this added value (de Jonge, 1996) and Scheffer et al. discuss the selling points of the real estate and look to the sales strategy of the organization (Scheffer et al., 2006). Lindholm mentions five measurements that could be considered that contribute to the supporting image of the organization (Lindholm & Leväinen, 2006):

- Select locations that attract customers
- Provide space that attracts customers
- Make symbolic statements through design and location
- Provide an environment that supports the sale
- Create workplaces that support the brand

Den Heijer uses the expression ‘practice what you preach’ as guideline for real estate interventions, ‘these interventions are usually linked to the organizations primary goals’ (den Heijer, 2011). This concerns the selection of the location, the symbolic appearance of the object (e.g. façade and interior), etc.

In conclusion one can state that supporting the image means the representation of the municipal goals by using the real estate object as a symbolic appearance of the organizations culture and function as well as the location of the object.

Increasing innovation

‘To stimulate renewal and improvement of primary processes, products and services by real estate’ (Zwart, 2014)

‘Organizations in competitive markets are depended on innovations to survive and grow’ (Van der Zwart, 2011). Lindholm et al. mentions four measurements to stimulate the increase of innovation (Lindholm & Leväinen, 2006):

- Develop usability of the workplaces
- Design facilities that allow innovative processes
- Emphasize knowledge work settings
- Allow users to participate in design phase

Den Heijer states that ‘innovation in primary processes can be achieved by stimulating planned and unplanned encounters between users’ (den Heijer, 2011)

In conclusion one can state that increasing innovation aims at facilitating innovative processes and innovative work ways, this is highly applicable in strong competitive markets.

3.4.3. Added values from financial perspective

The three added values within the financial perspective are cost reduction, risk control, and improving the financial position. These three added values will be discussed below.

Reducing costs

‘To reduce investment costs, capital costs, operational costs and other real estate related costs’ (Zwart, 2014).

Reducing costs is a definition which is to some extent self-explanatory. However, Nourse and Roulac speak of the necessity to make a clear distinction between cost effective on one hand and seeking the lowest occupancy cost on the other hand, All decisions should be cost effective for the quality space sought’ (Nourse & Roulac, 1993). Scheffer et al. distinguish the following types of costs (Scheffer et al., 2006):

- Workplace costs
- Accommodation costs
- Facility costs
- (Corporate) financing costs

In conclusion one can state that cost reduction entails the decision to be as effective as possible concerning financing costs, operational costs, and other real estate related costs.

Controlling risk

‘To anticipate on future real estate related technical and financial opportunities and risks’ (Zwart, 2014).

The future is hard to predict and several risks can occur in the near future, as well as in the far future. Scheffer et al. defined six indicators for the risk level of the real estate investments (Scheffer et al., 2006):

- Inflexibility of real estate portfolio
- Selection of location
- Value risk
- Changing working environment

-
- Environmental aspects
 - Development processes

To avoid some of these risks den Heijer states the following: controlling risks means 'controlling financial risks, for instance by being able to easily adjust the size and characteristics of the real estate portfolio following changes in the organization' (den Heijer, 2011). Another measurement which can be considered is maintaining a set minimum of quality which is necessary for the organization to operate and function as desired, this considers the technical condition of the real estate (den Heijer, 2011). Other measurements that can be considered to reduce or control the risk is opting for a mix of tenants, a rent and/or lease contract, monitoring the real estate market carefully for changes and take other contextual factors like legislation and regulation changes into account (Zwart, 2014)

In conclusion one can state that controlling risks considers being able to anticipate adequately on a changing environment in the context of juridical, technical, financial, regulation, and legislation future changes.

Improving the financial position

'To attract external financing to reinvest in the primary process or to improve the overall financial position of the organization by regarding real estate as an asset' (Zwart, 2014).

Here, real estate is seen as a capital asset that can contribute to optimizing the organization's overall financial position (Van der Zwart, 2011). De Jonge describes this added value as 'increase of value' where he focuses on the financial asset real estate represents (de Jonge, 1996). Scheffer et al. defined three managerial actions that could increase the value and therefore improve the financial position. The 'acquisition and disposal of real estate', 'redevelopment of real estate', and 'market analysis' all could contribute in improving the overall financial position of the organization (Scheffer et al., 2006). Den Heijer puts this into a wider perspective by stating that 'all real estate interventions that aim at resulting in a higher (market) value of land and buildings, for instance by making buildings rentable or marketable to a third party, suitable for external (paying) users or by acquiring land on valuable locations in the real estate market increase' (den Heijer, 2011). Lindholm make this explicit in the following four points (Lindholm & Leväinen, 2006):

- obtain current valuations of facilities
- select suitable locations
- make lease/purchase decisions on a facility by facility basis
- redevelop obsolete properties

'However, proper management of the company's portfolio must start with an inventory and valuation of current facilities, then management via a property information system' (Van der Zwart, 2011; Lindholm & Leväinen, 2006).

Improving the financial position includes that every real estate intervention contributes in the increase of the (market) value of the assets and decisions.

3.4.4. Conclusion

Many researchers have acknowledged the value of real estate can add to an organization. Over the years several researchers have defined a various amount of real estate added values.

This paragraph discussed nine different added values throughout the research field of (corporate) real estate management. These added values are seen from different perspectives and these are therefore linked to the perspectives derived from the third paragraph of this chapter. A high added value of the real estate for the municipal organization might imply that the organization should keep the real estate object in their portfolio. This will be discussed in the following paragraph. The total of perspectives, which serve as main criteria, and the added values, which are the sub criteria can be depicted as seen below in figure 10:

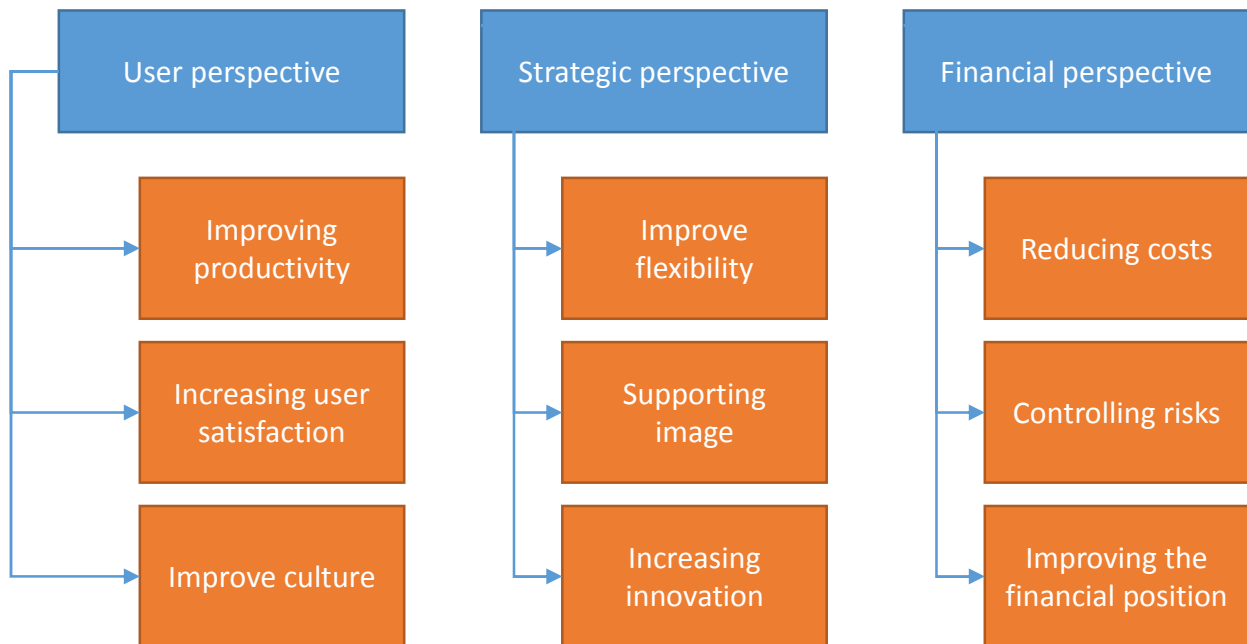


Figure 10: layout of perspectives and added values of real estate

3.5. Selling methods for public real estate

As discussed in the first chapter by Aalbers et al. and Gross et al. municipalities have often too much real estate which does not have to be owned intrinsically by the municipality (Aalbers & Heijnders, 2013), (Gross & Żróbek, 2015). A proper option for the real estate objects that do not add significant value to the municipal organization might be considered to sell. Having too much real estate in the portfolio can make an organization sluggish and rigid and the organization can therefore not adapt properly to changing environments (Berlin & Lexa, 2006). Rijksvastgoedbedrijf suggested several selling methods and how to put them into practice. Teuben investigated the factors that lead to the decision to sell a real estate object (Teuben, 2011). Based on this research from Teuben a matrix is drawn up where the selling methods from the Rijksvastgoedbedrijf are placed in. This matrix will be used to define the most suitable selling method for every individual real estate object from the municipality.

3.5.1. Selling methods

Selling a real estate object is often done in a time span of several months or even longer (Genesove & Mayer, 1994). Rijksvastgoedbedrijf defined five different selling methods for their surplus real estate ("Rijksvastgoedbedrijf Verkoopmethodes," 2015):

- A. Public sale with unconditional bidding
- B. Public sale with unconditional and/or conditional bidding
- C. Public sale with simple preselection

D. Public sale with unconditional bidding and an extensive preselection

E. Public sale via a real estate broker

These five selling methods will be discussed based on the proposed methods of Rijksvastgoedbedrijf as well as the methods suggested by Anke Sieverink (Sieverink, 2014; van Dijk, 2007). In this research study the researcher discusses six different selling methods which are defined in the following way (Sieverink, 2014; van Dijk, 2007):

- Private sale
- Auction
- Sale with registration or tender
- Limited preselection
- Rental buy
- Cooperation

A remarkable missing selling method in this list is the public sale via a real estate broker as suggested by the Rijksvastgoedbedrijf ("Rijksvastgoedbedrijf Verkoopmethodes," 2015). Since this research study concerns the sale of public real estate every selling procedure has to be public and a private sale for instance will therefore not be possible (stated in the Dutch law: Wet van openbaarheid bestuur; Law public governance) ("wetten.nl - Wet- en regelgeving - Wet openbaarheid van bestuur - BWBR0005252," n.d.). The auction method is common used with executorial sales (Sieverink, 2014), this will not be the case for public real estate since it is highly unlikely that the municipality is forced to an executorial sale. The last two selling methods from Sieverink, rental buy and cooperation, might be interesting for a municipality when it concerns strategic (re)development of real estate. The cooperation form is often known as the abbreviation PPP; public private partnership (Gangwar & Raghuram, 2015). A rental buy method might be an interesting option when the buying party does not have sufficient financial capabilities to buy the object before redevelopment. The remainder two selling methods from Sieverink, limited preselection and sale with registration or tender, are two methods which allows the selling party to keep control of the future development plans of these objects. The selling party is able to steer the project to a certain extent, in the end the buying party will be responsible for making the final decisions on the project (Sieverink, 2014).

As the selling methods from the Rijksvastgoedbedrijf provide a complete overview of methods for selling public real estate these selling methods will be used throughout this research study. These five selling methods can be defined as:

A: Public sale with unconditional bidding:

This is a traditional selling method for relatively marketable real estate objects. The potential buyer only has the option to bring out an offer without any preconditions ("Rijksvastgoedbedrijf Verkoopmethodes," 2015). This selling method is much alike the private sale, however this considers a public sale and not a private sale (Sieverink, 2014). Examples of real estate which is sold via this method is a monumental canal house with a housing or working function.

B: Public sale with unconditional and/or conditional bidding:

This selling method is much alike the previous selling method, however, in this case the buying party is able to define additional conditions to the bid. This way the potential buyer can

transfer some of the responsibilities and the risks of the project to the selling party ("Rijksvastgoedbedrijf Verkoopmethodes," 2015). This is a way to interest buying parties to accept slightly more complex and risk full project than it is the case for selling method A. The offering party judges every single offer on potential risks and checks them whether the risk is acceptable or not for the given price. If the total offer is acceptable the real estate object can be allocated to a buying party.

C: Public sale with simple preselection:

With a simple preselection, additional demand can be used for the selection of potential buyers. Financial demands, references or administrative demands can be asked by the selling party ("Rijksvastgoedbedrijf Verkoopmethodes," 2015). Using this selling method and this preselection will create more certainty whether the potential buyer is able to fulfill the complex (re)development exercise (Sieverink, 2014).

D: Public sale with unconditional bidding and an extensive preselection:

This method is applied on complex redevelopment objects where the selling party wants to have a strong influence on the developments of the plans. Using an extensive selection procedure enables the selling party to direct the plans into the desired direction ("Rijksvastgoedbedrijf Verkoopmethodes," 2015). The selling party is able to steer on quality and to ask additional demands concerning the quality of the end product. After the potential buyers have stand out throughout the entire selection procedure they are allowed to make an unconditional offer. It is common that in this procedure the buying parties offer new development plans. Based on this and other background information of the buying party the decision can be made by the selling party (van Dijk, 2007).

E: Public sale via a real estate broker:

This is a method in which the selling party can opt for when a (local) real estate broker adds value to the object due to specific market knowledge or an extensive network ("Rijksvastgoedbedrijf Verkoopmethodes," 2015). Usually this concerns relatively marketable objects such as retail real estate or housing real estate.

3.5.2. Deciding to sale

The decision to sell a real estate object from the real estate portfolio is a rather big decision which could implicate major changes on the total real estate portfolio, the municipal policy and the users of the real estate. Teuben discusses the public real estate management in his research (Teuben, 2011). From this research he was able to prepare a decision tree which could be applied upon public real estate objects. This decision tree is presented in Appendix 1 and contains the following four decisions:

- 1 The first statement of the researcher is that if a municipality does not have a professionalized (real estate) organization the municipality should either consider to sell the real estate, outsource the public real estate management, or professionalize the (real estate) organization. Acting upon these actions will result in more rational decisions in political context and let the emotion not influence the decision (Korsten et al., 1993). Basic rule should be that the applied rent should be at least cost covering and, if possible, be in conformity with market rents.

-
- 2 Second Teuben states that the real estate owned by the municipality has to contribute to the municipal policies, i.e. it has to add value to the municipal organization. If the real estate does not add value to the municipality (e.g. commercial real estate) the municipality should sell the real estate (Teuben, 2011). However, the real estate object can be kept in the real estate portfolio when ideological considerations are taken into account, e.g. monumental objects. This type of ideological consideration can be obtained in the strategic perspective from the municipality where the supporting image of this real estate contributes to the supporting image of the municipality as a whole (Lindholm & Leväinen, 2006).
 - 3 Besides, the question arises whether the real estate object is marketable or not. If the object has a relatively low marketability the researcher suggests that the municipality should keep this real estate object in their real estate portfolio (Teuben, 2011).
 - 4 When the real estate object is marketable the municipality should ask themselves whether the time span of use will be relatively short (less than 10 years) or long. When the time span of use is relatively short the municipality should consider renting the real estate instead of owning the object. This can be done via a sale and lease back construction (Tipping & Bullard, 2007). If the real estate object will be used for a longer time span the municipality should keep the real estate object in its real estate portfolio.

Interpreting these decisions as suggested by Teuben results in the following matrix as shown below, figure 11. In this matrix two axes can be identified. The vertical axis represents the marketability of the real estate object. The horizontal axis represents the level of added value of the real estate object for the organization. The four (blue and orange) quadrants in this matrix correspond to the four follow-up actions from the last three questions of Teuben. These four quadrants can be considered as:

- Left bottom; consider sale, unless the monumental status gets lost.
- Right bottom; maintain in portfolio, the object is strategic and unmarketable
- Left top; consider sale, the object is not strategic and marketable
- Right top; depending on the time span of using the object (<10 years) the municipality could consider to sale and lease back, the object is strategic and marketable

As can be seen multiple areas are enclosed with a line with a character which corresponds to one of the selling methods as discussed in the previous sub paragraph. An additional area is indicated with an F, which is the right bottom quadrant which implies that the municipality should maintain the object in their portfolio. The areas A, B, C, D, and E are representing a selling method. The placing of these areas is discussed below.

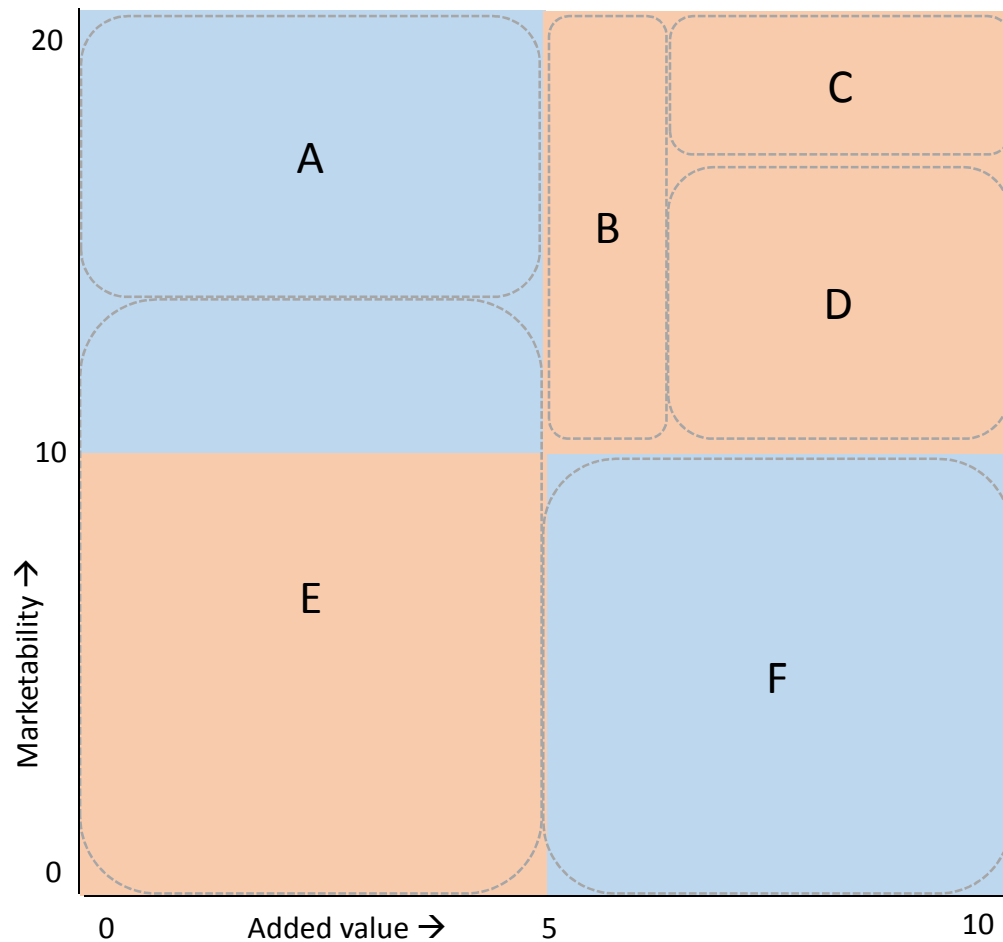


Figure 11: Matrix marketability versus added value of real estate

The five selling methods are placed in the matrix as depicted in figure 11. The left top quadrant are rather marketable objects which implies that there are relatively many available on the market, and since the object does not add significant value a relative easy selling strategy can be obtained. A relative simple selling method is (A) public sale with unconditional bidding. The municipality announces that the real estate object is available for sale and every other organization is allowed to make an offer. Another relative simple selling method is (E) public sale via a real estate broker. A real estate broker is operable in local markets and adds additional knowledge to the selling procedure, less marketable objects can be sold via this selling method (“Rijksvastgoedbedrijf Verkoopmethodes,” 2015), (Sieverink, 2014).

Adding additional conditions to the bidding procedure and the bids applies on real estate objects which have a higher added value for the municipality than the real estate objects which will be sold with the selling methods A or E. The remainder three selling methods are able to preset extra conditions which have to be met by the buying party. These methods are therefore applicable on real estate objects which have an above average added value and an above average marketability (top right quadrant).

Public sale with unconditional and/or conditional bidding is a selling method which can add additional conditions to the bid and the bidding procedure. This method can be applied on objects that have an above average marketability and an average added value for the municipal organization. The remainder two selling methods in the top right quadrant are

public sale with simple preselection and public sale with unconditional bidding and an extensive preselection. With these two selling methods the municipality is able to select bidding parties which are for example reliable and able to redevelop the real estate object (financially strong or qualitative good comparable projects). These two selling methods are applicable on real estate objects that are considered as relatively high added value objects ("Rijksvastgoedbedrijf Verkoopmethodes," 2015).

To make the two axis more tangible two scales will be added. The horizontal axis, which defines the added value, runs on a scale from 0 to 10 and is defined by the derived added values from the fourth paragraph. Every object will be rated for the nine criteria. To make the marketability axis, the vertical axis, more tangible a scale of examples will be given which represents the marketability of different real estate objects, this scale will go from 0 to 20.

Real estate can be not marketable when the object is rather specific, unsaleable, and/or has few referential transactions (van der Geert, 2006) . In table 5 20 examples are given of different real estate objects. These real estate objects are ranked in order of marketability by experts (van der Geert, 2006). These examples serve as a scale to place real estate objects on to define the marketability of that particular real estate object. However, a decision maker might slightly differ from this scale when additional circumstances influence the marketability in a positive or negative way, e.g. a bad neighborhood will decrease the marketability of the real estate object.

Table 5: Ranking order of not marketable to marketable real estate (van der Geert, 2006)

Object	Rank
Oil refinery	1
Prison	2
Airport	3
Municipal swimming pool	4
Hospital	5
Shipyards	6
School	7
Elderly care	8
Horse riding school	9
Golf lane	10
Bungalow park	11
Sports school	12
Outdated vacant office	13
Pump station	14
Hotel	15
Auto showroom next to highway	16
Decayed office space in residential area	17
Parking garage	18
Police station in authentic villa neighborhood	19
Obsolete parking lot in the city	20

3.5.3. Discussion

In conclusion there are several ways the real estate objects can be handled. When the added value to the municipality has been calculated and the marketability has been defined the real estate object can be placed in the marketability vs added value matrix. This matrix consists of various areas with recommendations. Based on the location of the real estate object in the matrix a recommendation on the follow up step will be given. The different actions that can follow from this matrix are:

- Public sale with unconditional bidding (A)
- Public sale with unconditional and/or conditional bidding (B)
- Public sale with simple preselection (C)
- Public sale with unconditional bidding and an extensive preselection (D)
- Public sale via a real estate broker (E)
- Keep real estate object in real estate portfolio (F)

However, these are recommendations and the borders forming the four quadrants are based on the mean of the scales. Every recommendation should be interpreted with care before acting upon it.

3.6. Conclusion

This literature study discussed four topics; factors influencing the decision behavior, public real estate management, the added value of real estate within the municipal organization, and selling methods. These studies contribute in providing an answer to the following three research question as defined in the first chapter:

- 1) *What factors influence the decision behavior around the added value of real estate for the municipal organization?*
- 2) *Which criteria determine the added value of real estate to the municipal organization?*
- 3) *Which selling methods are there for public organizations to assure a satisfying balance between profit and influence?*

3.6.1. Factors influencing the decision behavior

The first sub question can be answered with the discussed literature from paragraph 3.2. This paragraph discusses the following four factors that might influence the importance of added values for a municipal organization. These four factors are:

- The type of real estate organization
- The size of the municipality
- The demographic transition of the municipality within the coming ten years
- The type of real estate

Within these factors a distinction is made between various categories. The categories for the types of real estate are:

- Real estate company
- Centralized real estate department
- Decentralized real estate department

As discussed in paragraph 3.2 many municipalities are adopting a centralized real estate organization structure to be able to professionalize their real estate management.

The municipalities that are examined will be categorized as well into the following categories:

- Small; < 20.000 inhabitants
- Medium small; 20.000 – 50.000 inhabitants
- Medium large; 50.000 – 100.000 inhabitants
- Large; 100.000 < inhabitants

The demographic transition has an influencing factor as well on the decision behavior. The categories within this factor are as follows:

- Shrink: < 0%
- Growth below national average: 0% - 3,4%
- Growth above national average: > 3,4%

The final factor that might differ the importance of added values of real estate is the type of real estate being dealt with, the categories defined within this factor are as follows:

- Real estate used for own direct services
- Social real estate
- Commercial real estate

3.6.2. The added value of real estate

The second sub question can be answered with the third and fourth paragraph of this literature study. The third paragraph discussed public real estate management, from this literature review the following three perspectives are derived:

- User perspective; *as seen from the end users of the real estate object*
- Strategic perspective; *as seen from the policy making persons within the municipal organization*
- Financial perspective; *as seen from the treasury department, which is responsible for the financing aspect of the real estate solution*

The fourth paragraph gave a more in-depth literature review on the value real estate can add to the municipal organization. From this discussion nine added values were derived and placed within the three perspectives as described above. This will give the following layout:

- User perspective
 - Improving productivity; *to increase production through a more effective use of real estate*
 - Increasing user satisfaction; *to create functional, pleasant and comfortable places for visitors, consumers and employees*
 - Improving culture; *to improve interpersonal relations and communication by real estate*
- Strategic perspective
 - Improving flexibility; *to structure a real estate portfolio in such a way that future spatial, technical, organizational and juridical adjustments are possible*
 - Supporting image; *To express municipal objectives by using real estate as an icon for the organizational culture*

- Increasing innovation; *to stimulate renewal and improvement of primary processes, products and services by real estate*
- Financial perspective
 - Reducing costs; *to reduce investment costs, capital costs, operational costs and other real estate related costs*
 - Control risks; *to anticipate on future real estate related technical and financial opportunities and risks*
 - Improving the financial position; *to improve the overall financial position of the organization by regarding real estate as an asset*

3.6.3. Applying Selling methods onto public real estate

These selling methods are placed in a matrix defined by the horizontal axis; the added value of the real estate object, and the vertical axis; the marketability of the real estate object. Every individual real estate object can be placed in the matrix. First the added value has to be calculated after which the marketability has to be determined. The matrix is filled with different areas which correspond to one of the following follow up actions:

- Public sale with unconditional bidding (A)
- Public sale with unconditional and/or conditional bidding (B)
- Public sale with simple preselection (C)
- Public sale with unconditional bidding and an extensive preselection (D)
- Public sale via a real estate broker (E)
- Keep real estate object in real estate portfolio (F)

The way these follow up actions are placed in the matrix can be seen in figure 11 paragraph 3.5.2.

4. Research Approach

Abstract

Analytical Hierarchy Process is a multi-criteria research method. This research method is used in this study to define the added value of real estate for a municipal organization. Public real estate management can be defined via three main perspectives which are used in real estate related decisions: user perspective, strategic perspective, and financial perspective. Each of these perspectives are defined via three sub criteria; as part of the added value of real estate. A total set of nine added values of real estate define the total value of a real estate object. Municipalities differ from each other and this can be seen back in the way these municipalities approach their real estate portfolio and prioritize the added values of real estate. This research study examines these different approaches and puts the main perspectives and added values of real estate into practice with a case study.

Keywords: Analytical Hierarchy Process (AHP) method, Consistency Ratio, case study, public real estate management, real estate added values

4.1. Introduction

4.1.1. Problem introduction

As stated before there is a major opportunity for municipalities in downsizing their real estate portfolio. However, this procedure cannot be done without thorough considerations regarding every individual real estate object. As defined in the previous chapter various aspects are taken into account in defining the added value of a real estate object for the municipal organization. These aspects (criteria) cannot be seen equally important. Their relative importance may differ for different situations and different types of real estate. Therefore a more specific approach is required to determine these relative importance.

4.1.2. Relevant scholarship

The added value of real estate has been researched several times by various researchers as discussed in paragraph 3.4. Van der Zwart looked in his research study to real estate added values as well (Zwart, 2014). In his research study he performed a questionnaire among real estate managers in the hospital market. He asked the respondents to rank the added values from least important to most important (Van der Zwart, 2011). These added values were then ranked from 1 to 9 and the difference of importance between every added value was equal. With the AHP (Analytical Hierarchy Process) research method, which is used here, it is possible to vary in differences of the importance between the added values. It is therefore likely to assume that the weights of these added values will differ from the ranking researched by van der Zwart (Zwart, 2014).

The AHP method will be applied onto public real estate management and the added values of real estate. The previous chapter discussed public real estate management and the added values of real estate. The AHP method is a multi-criteria research method designed by Saaty (Saaty, 1980). Saaty performed many research studies with this research method, Aragonés et al. and Mawuntu used the AHP as well in defining the weights of different criteria in multi-criteria decision making (Aragonés-Beltrán, Chaparro-González, Pastor-Ferrando, & Pla-Rubio,

2014) (Mawuntu, 2014). These researches will be discussed throughout this chapter as well as other research studies conducted in this field.

4.1.3. Hypothesis

In the previous chapter four factors were identified that influence the decision behavior in defining the added value of real estate. In this section data will be collected on the importance of the different added values, this data can be analyzed which can contribute in providing an answer to the sub question as defined in the first chapter: 'How do these factors influence the decision behavior?' The other research question which will be researched in this chapter is: 'How do these criteria relate to each other and what is their relative importance?' This relative importance per added value can be found via a questionnaire and the AHP research method. It is likely to assume that these added values, in contrast with the method used by Van der Zwart, are not just ranked from 1 to 9 (Zwart, 2014). These added values will be weighted after which the most important added values can be identified.

After the analysis on the results from the questionnaire has been conducted, a case study will be performed where the findings from the questionnaire and the data analysis will be put into practice. The added values of real estate as defined in the previous chapter are quite generic and it is therefore interesting how they will behave in combination with specific real estate objects.

4.2. Research method

This paragraph describes the basic principles of the Analytical Hierarchy Process (AHP) research method used to analyze the data to useable criteria weights. The second subparagraph will look into the basics of consistency and the third subparagraph will discuss the application of AHP onto this research study.

4.2.1. Basics of AHP

In 1980, T.L. Saaty published his first book about the AHP entitled *The Analytic Hierarchy Process: Planning, Priority Setting, Resource Allocation* (Saaty, 1980). In the publication he describes the Analytical Hierarchy Process as a multi-criteria decision making approach which arranges factors in a hierarchic structure. This paragraph will provide the steps that are needed in order to conduct an AHP study.

First of all the overall goal has to be stated. Then the criteria have to be formulated which are the decisive factors of the alternatives. The overview structure of the AHP is depicted in figure 12.

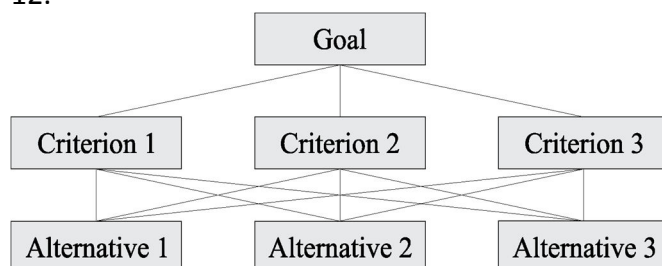


Figure 12: Structure of AHP model

Saaty states that arranging goals, attributes, issues, and stakeholders in a hierarchy serves two purposes (Saaty, 1990). Firstly, it unveils complex relationships among criteria and alternatives

and gives an overall view of the examined case. Furthermore, the AHP enables the decision makers to accurately compare homogeneous elements because they are able to assess the order of magnitude.

The order of magnitude among the levels is frequently defined by pairwise verbal judgments ranging from equal to extreme. Saaty et al. proposed a verbal scale of judgments which accompanies the AHP, as can be seen in table 6 (Saaty & Vargas, 2006). This table shows the numerical values 1, 3, 5, 7, and 9. These correspond to a verbal scale with an explanation as defined by Saaty & Vargas (Saaty & Vargas, 2006).

Table 6: Saaty scale pairwise comparison values (Saaty, 1990)

Numerical values	Verbal scale	Explanation
1	Equal importance of both elements	Two elements contribute equally
3	Moderate importance of one element over another	Experience and judgment favour one element over another
5	Strong importance of one element over another	An element is strongly favoured
7	Very strong importance of one element over another	An element is very strongly dominant
9	Extreme importance of one element over another	An element is favoured by at least an order of magnitude
2,4,6,8	Intermediate values	Used to comprise between two judgments

The most effective way to concentrate judgment is to take a pair of elements and compare them on a single property without concern for other properties or other elements (Saaty, 1990). The judgments of criteria and alternatives are commonly gathered by the use of questionnaires or other forms of data collection.

In order to be confident about the outcome of the research approach, these judgments relies on experts that are involved in the matter. However, if the alternatives are too complex, it can also be judged by one or more experts in the particular field of expertise.

The next step in the Analytical Hierarchy Process is to combine the results of the collected data and form a matrix of the pairwise ratios among the criteria. The numerical values, e.g. scores, of each comparison are used to calculate the matrix and consist of positive entries.

$$\begin{array}{c}
 A_1 \quad A_2 \quad \dots \quad A_n \\
 \begin{array}{c} A_1 \\ A_2 \\ \vdots \\ A_n \end{array} \begin{pmatrix} w_1/w_1 & w_1/w_2 & \dots & w_1/w_n \\ w_2/w_1 & w_2/w_2 & \dots & w_2/w_n \\ \vdots & \vdots & \ddots & \vdots \\ w_n/w_1 & w_n/w_2 & \dots & w_n/w_n \end{pmatrix}
 \end{array}$$

In order to make the different values of w_n/w_n unique, the entries have to be normalized by dividing them by the sum of the column. However, normalization at this stage is not mandatory; it can also be done after the calculation of the priority vector.

The priority vector, which indicates the fraction of importance of the elements, can be calculated with numerous methods. The most general used methods are the Eigenvector and the Geometric Mean, the latter is also known as the Logarithmic Least Square. It is known that the two methods coincide if A is less or equal to three, however, when computing the priority vector with more than three elements the result significantly differs from each other (Saaty, 1998). Saaty uses the Eigenvector method for the AHP, however, due to its complexity, the Geometric Mean is more favorable in this case (Saaty, 1990).

The Geometric Mean can be calculated by multiplying each entry in a row and divided this number with the n^{th} root (Saaty & González, 1991). For example, if there are three criteria, the formula for calculating the Geometric Mean of the first row would be:

$$A1 = \sqrt[3]{\frac{W1}{W1} * \frac{W1}{W2} * \frac{W1}{W3}} \quad (1)$$

When all the priority vectors of all rows are computed, normalization of these vectors is the next step if not done previously. The outcome of the AHP is a fraction between 0 and 1, which can be translated to percentage of favorable due to the fact that the sum of these fractions equals 1.

4.2.2. Consistency

The next step is to calculate the Consistency Index and the Consistency Ratio of the criteria. This is an important aspect in the AHP research model. Due to the shape of the questionnaire respondents may interpret several things different and fill in the questionnaire inconsistently. This could also happen if different respondents have different preferences. The Consistency Ratio (CR) can be calculated by dividing the Consistency Index (CI) with the Random Index (RI). The Random Index is given in the table that is provided in the article 'How to make a decision: The Analytical Hierarchy Process' (Saaty, 1990). The CI can be calculated using the different consistency measures and are calculated as follows; the sum of the quotations of the factor times the priority vector considering this factor. This sum is divided by the priority vector of the concerning criteria. These consistency measures are calculated for all of the criteria. Next, the Consistency Index can be calculated using the following equation, where N is the number of criteria:

$$CI = \frac{(Average\ of\ consistency\ measures) - n}{n - 1} \quad (2)$$

If the Consistency Ratio is below 0.1 (below 10%) then the outcome of the questionnaire is consistent and therefore useable for the study (Saaty, 1990). After calculating the priorities among the criteria, the priority vectors of the alternatives has to be computed with the same procedure as mentioned earlier. The final step is to combine the results in order to evaluate the best alternative, based on the preference of the criteria. The alternatives' scores have to be multiplied with the importance, e.g. priority vectors, of the criteria; the sum of these calculations will provide the overall acceptance of an alternative, i.e. in this research study the total added value of one real estate object for the municipal organization.

4.2.3. Application of AHP

The goal of this AHP structure is to find the real estate object which suits the real estate portfolio of the municipality the best. A high score on the final result means that the alternative, a real estate object, fits the means and goals of the real estate portfolio of a specific municipality relatively good. A low score means that the alternative does not fit the real estate portfolio well. The goal is placed on top of the tree structure as can be seen in figure 13 below. The second part of this AHP structure contain the criteria, these are divided

in two layers, the main criteria and the sub criteria. In this case the main criteria are the three perspectives as discussed in the third chapter (user, strategic, and financial perspective). The sub criteria are the nine added values of real estate, discussed as well in the third chapter. These nine added values are placed underneath their corresponding perspective as depicted in figure 13. These nine added values all affect the alternatives, which are placed at the bottom of the hierarchy structure. The amount of alternatives can vary and depends on the amount of real estate objects that are examined.

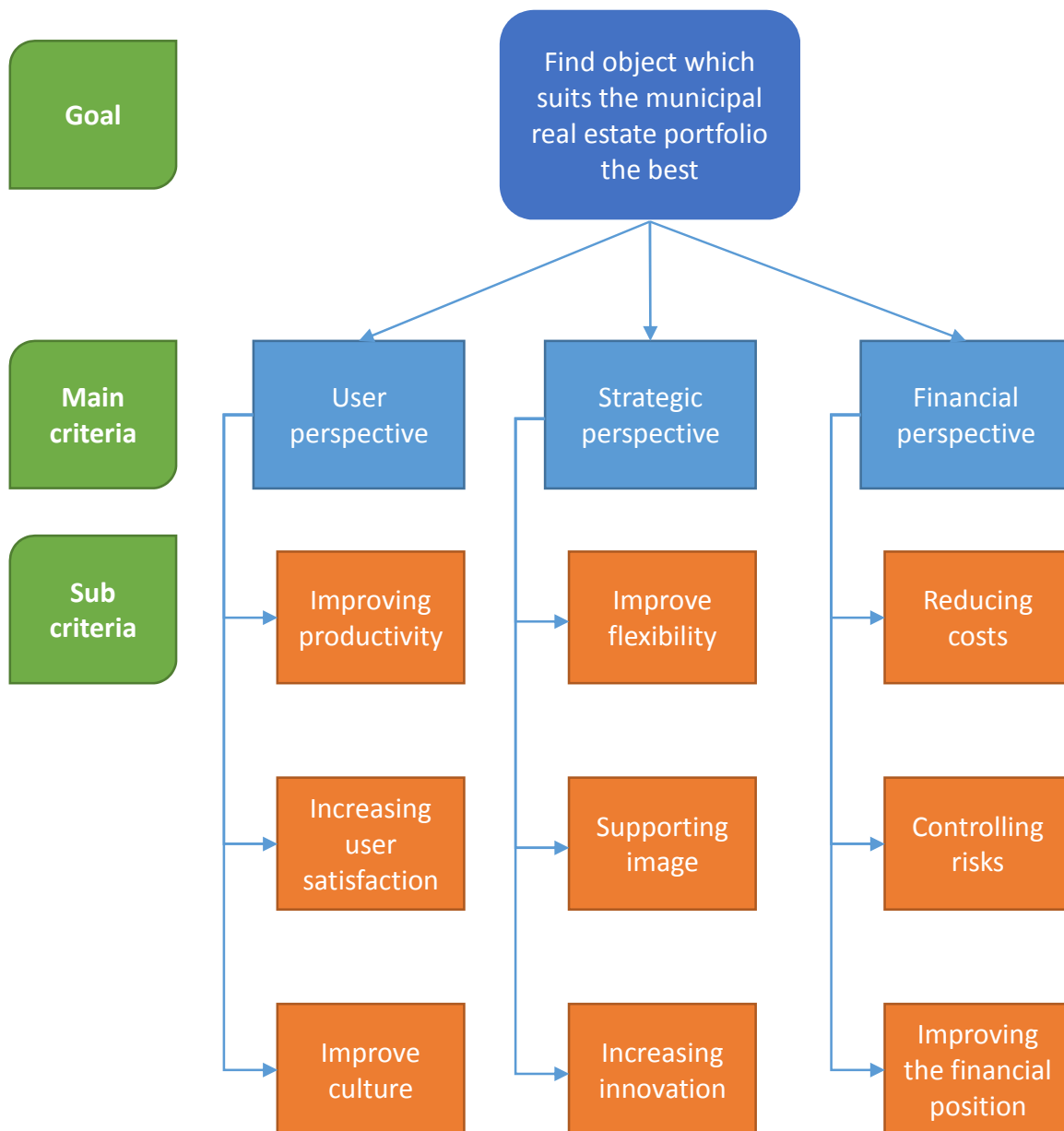


Figure 13: AHP model applied on research study

The end goal is to prepare a decision support tool which supports the municipality in defining the added value of a particular real estate object for their municipal organization. High scores of the real estate object on every individual sub criteria will result in a high overall score, i.e. the real estate has a high added value for the municipal organization. Since not every municipality is the same and not every real estate object is the same the different criteria will not be equally important throughout every type of real estate or municipality. The major

differentiation points that distinguish municipal (real estate) organizations differ from each other are influenced by the size of the municipality, the demographic transition, and the position of the real estate organization within the municipal organization. When real estate objects do not contribute value to the municipal organization a follow up step might be to sell the real estate object. However, since every object has some sort of uniqueness, a proper real estate selling method will be proposed for the particular real estate object that does not add significant value to the municipal organization

4.3. Questionnaire

A common used questionnaire design for the AHP research method is pairwise comparison as described in the previous paragraphs (Saaty, 1998). This question method will be used throughout the questionnaire. Before the actual questionnaire can be designed and spread among respondents the input derived from the literature review in the third chapter needs to be processed in such a way that it will become useable and understandable for the respondent. The respondent is required to make pairwise comparisons on all sets of (sub) criteria. A proper definition is required on these (sub) criteria as well as on the different types of real estate taken into account in this research study. This definition has to be in line with the discussed theory from chapter 3, the application of these (sub) criteria in a municipal context and, third, understandable for the respondent. In the following subparagraph the characteristics of the respondents which will be approached for this research study will be described. After which the definitions used in the questionnaires and the designing of the questionnaire will be discussed.

4.3.1. Respondent characteristics

To be able to contact the right respondents, a clear description of the respondents' identity is made. Since the decisions for public real estate of the municipalities is made by the municipalities themselves it is logic that the respondent needs to be working for a municipality. The respondent needs to know the sufficient amount of jargon to be able to fill in the questionnaire. Therefore, it has to be a person working on a daily base with real estate. The respondent needs to be aware of the policy (of the municipality they are working for) in regards to the real estate and the real estate portfolio of the municipality. Therefore, the person needs to be working for a municipality and needs to be responsible, or has a clear overview of the activities of the real estate department of the municipality. Since solely Dutch municipalities will be approached the questionnaire will be in Dutch, the original questionnaire can be found in appendix 2. Every municipality is approached in various ways, via contacts, via telephone, by direct e-mail to the respondent, or by a general e-mail send to the service desk of the municipality.

4.3.2. Preparing the questionnaire

Throughout the questionnaire the various added values, perspectives, and types of real estate will be examined. In order to have the respondent fully understand the definitions as given in the literature review a certain interpretation of the definitions is required. This chapter will discuss the used added values (sub criteria), perspectives (main criteria), and the three types of real estate. The three types of real estate as defined in the literature review are:

- Real estate used for own housing
- Social real estate

- Commercial real estate

Real estate used for own housing is defined as real estate which belongs to the category 'own accommodation' is real estate that is used for the municipal services. Examples of real estate objects used for own housing are:

- City office
- Town hall
- Other offices that are used for the municipal services.

The definition of social real estate is based on the definition of De Jonge: 'Social real estate is real estate which can serve as a goal on its own and not as real estate to achieve a profit margin on' (Kuijten, 2010; De Jonge, 2010). Various examples of social real estate are given to give the respondent a concrete idea of what social real estate contains ("Maatschappelijk vastgoed | Bouwstenen voor Sociaal," 2015):

- Education (e.g. school)
- Sports (e.g. sports hall, sports accommodation)
- Culture (e.g. museum, library)
- Well-being (e.g. community center, church)
- Social security (homeless shelter)
- And/or (medical) care (General Practitioner center)

The last type of real estate taken into account in this research study, and therefore this questionnaire, is commercial real estate. In essence commercial real estate can be defined as real estate a profit margin can be achieved on. Examples of this type of real estate are:

- Warehouse
- Shop in the city center
- Office building
- Residential house

As discussed the questionnaire will consist of pairwise comparisons where the (sub) criteria will be compared to each other. Before this comparison can be made a proper definition has to be given on these (sub) criteria in order to have valuable responses. There are several (sub) criteria which are relatively straight forward. The definition of the perspectives for example can be interpreted easily by the respondents as defined in the previous sub paragraph. The defined definitions for the perspectives as can be seen in the third chapter will therefore be used in the questionnaire as well. Some of the added values are relatively self-explanatory as well, e.g. improving productivity, increasing user satisfaction, improve culture, improving flexibility, supporting image, reducing costs, risk control, and improving the financial position. The added value that needs a more elaborate explanation is increasing innovation. The defined definition from the third chapter is: In conclusion one can state that increasing innovation aims at facilitating innovative processes and innovative work ways, this is highly applicable in strong competitive markets. The essence of this added value is to innovate the services and business processes and to improve the quality of the organization. Looking to social real estate this can mean that the services taking place there are contributing to a more innovative working environment, i.e. the users are improving their skills they are executing there, e.g. a stimulating educative environment in schools. To sum up the definitions will be used throughout the entire questionnaire and this research study:

User perspective

With the user perspective taken into consideration it will be reasoned from the user. How does the user experience the real estate object and what are his or her wishes.

Strategic perspective

In the strategic perspective a reasoning on governance level is made, how does the decision fit into the policy of the municipality and the available area development plans. These are decisions commonly made based on long term plans. The results of these decisions often have their influence in the long term as well.

Financial perspective

The financial perspective, from this perspective the financial possibilities and operating costs of the real estate object are considered.

Improving productivity

Improving the productivity of the real estate means that the real estate is used in an optimal way and that the activities that take place in the real estate object can be executed in the best possible way

Increasing user satisfaction

Creating a functional, pleasant, and comfortable environment for visitors, users, and employees. This concerns the real estate object, the surrounding area and the accessibility of the real estate.

Improve culture

Creating a facility where interaction takes place and a culture is being formed where people are attracted to, both the culture as the real estate object itself.

Improving flexibility

Flexibility from a strategic point of view means that the real estate portfolio is arranged in such a way that an adequate and rapid reaction can take place to future spatial, technical, organizational, and juridical changes

Supporting image

Representing the municipal goals by using the real estate as an icon for the organization culture.

Increasing innovation

The improvement and renewal of services the municipality offers to its society using the presence and accessibility of real estate (education, well-being, sport, city office etc.)

Reducing costs

Reducing the investment costs, costs for financing, operational costs, and other real estate related costs

Controlling risk

Anticipating to future real estate related technical and financial opportunities and threats.

Improving the financial position

Improving the financial situation in the accounting and on the balance sheet.

4.3.3. Questionnaire design

The final stage in preparing the questionnaire is designing the questionnaire. As discussed previously the pairwise comparison questioning method is a common used method in AHP research methods. In order to have the respondent fully understand the basic principles of pairwise comparison an example is given on how pairwise comparison works. This example of pairwise comparison is depicted in figure 14.

However, before the respondent reaches the part of the questionnaire consisting all of the pairwise comparisons the respondent is asked to fill out various questions concerning the background information. This concerns the municipality the respondent is working for, the function of the respondent within the organization, and several characteristics of the organizational structure of the particular municipality.

The questionnaire is designed with an online tool which enables the respondent to fill out the questionnaire online ("ThesisTools - Student&Onderzoek, maak & verspreid gratis de online enquête voor je scriptie - Enquête, Vragenlijst, Onderzoek," n.d.). As stated before an example of a set of pairwise comparisons is depicted in figure 14. As can be seen in this figure the question is first asked above the matrix. The matrix contains the numbers 9, 7, 5, 3, 1, 3, 5, 7, and 9. These numbers correspond with the verbal explanation of the importance factors as discussed in the previous paragraph (Saaty, 1998). The numbers on the left side correspond to a higher importance of the first criteria and the numbers on the right side correspond with the criteria on the right side. The entire questionnaire is written in Dutch and can be found in appendix 2.

Which perspective do you think is more important?

	9	7	5	3	1	3	5	7	9
User perspective vs Strategic perspective	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
User perspective vs Financial perspective	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Strategic perspective vs Financial perspective	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

Figure 14: Illustration of set of pairwise comparisons from the questionnaire

4.4. Data analysis

This paragraph will discuss the data analysis. First the retrieved data needs to be prepared to be analyzed. The outcome of the questionnaire will be transformed to usable data which will be analyzed on consistency. The respondents that filled out the questionnaire (partially) consistent are taken into account in analyzing the retrieved data. These respondents will be analyzed after which the retrieved consistent data from these respondents will be used for analysis.

4.4.1. Outcome of the questionnaire

As stated in the previous paragraph every municipality in the Netherlands is approached for participating in the research study. Eventually 56 municipalities/respondents opened the questionnaire, this is a response rate of approximately 15% of all of the municipalities in the Netherlands. These 56 responses will be looked into before they are processed further according to the AHP calculation method.

From the results 13 respondents stopped the questionnaire after the first page of questions (the page containing the basic background questions). Various reasons can be given for this. It can be due to (design of) the questionnaire, e.g. wrong expectations given in the introductory text. However, it might also be possible that the respondent was distracted after the first page after which the respondent did not finish the questionnaire. A third reason might be that the explanatory pages (page 3 and 4) from the questionnaire were too complicated or not interesting enough to keep the attention and therefore the presence of the respondent. Consequently these 13 responses are not useable for this research study and will therefore be left out.

A second group which can be identified from these 56 respondents are the respondents which filled out the entire questionnaire. However, they were not willing to fill in numbers in the pairwise comparison (or made them all equal) and left a comment on the questionnaire in the end. The following comments were retrieved from in total of four respondents:

- 'I do not share your vision on the possible decisions I can make as you may understand from my answers. Every decision is a carefully weighted decision which takes into account every aspect.'
- 'I have valued all criteria equally important. The way the questions are designed are not relevant to my opinion. It assumes that there is solely one truth applicable on all situations which is not true according to me. In practice, steering on and decisions around public real estate takes into account (A) more aspects and (B) are weighed differently per case.'
- 'The pairwise comparisons were hard to explain. In many cases they are equally important or they differ per real estate object or the process is in the beginning which prohibits to make define these weights.' And 'the case in our municipality is that the focus at the moment is on bringing structure and overview to the real estate portfolio. The strategic perspective is therefore undervalued.'

As can be seen from these comments these respondents disagree with generalizing real estate from the municipality. They approach every real estate object individually and assign different weights for the various (sub) criteria per case. The second comment states that in practice more aspects are taken into account.

4.4.2. Consistency

In order to check the consistency of the responses every single set of comparisons needs to be checked. The Consistency Rate will be calculated as discussed earlier in this chapter. In the appendix 3 an overview is given on all of the consistency ratios per set. When a consistency rate of 0,1 is applied onto the sets of comparisons there are few consistent sets throughout the entire dataset, appendix 4A. These amounts of consistent sets are not high enough to make reliable calculations with. Grzybowski describes in his article the different methods of dealing with inconsistency (Grzybowski, 2015). One method which requires a high

understanding of the researcher is interpreting all of the results and adjusting them in such a way that the initial idea will not be lost. Another possibility is changing the Consistency Rate as discussed in Grzybowski' research article (Grzybowski, 2015). However, this method questions the Consistency Rate of 0,1 and finds the acceptable height of the Consistency Rate. A Consistency Rate of 0,2 is still acceptable, if the rate will be driven even further up the results will become less reliable. For this research study the following Consistency Rates are examined and the results are displayed in appendix 4B and 4C. The amount of consistent sets increase substantially when raising the Consistency Rate to 0,15 (a minimum of 13 sets of comparisons per type of comparison). However, further increase of the Consistency Rate to 0,2 will not give a substantial increase in the amount of consistent sets. To be able to use enough data for the data analysis a Consistency Rate of 0,15 will be used, table 7. A total of nine respondents were unable to fill out the questionnaire consistently, these nine responses will therefore be left out of the analysis of the results of the data.

Table 7: Number of consistent sets with a CI of 0,15

Consistency Rate: 0,15	Social real estate	Real estate for own housing	Commercial real estate
Perspectives	13	21	16
Sub criteria in user perspective	16	20	18
Sub criteria in strategic perspective	22	21	18
Sub criteria in financial perspective	20	19	23
Complete sets	5	10	8

4.4.3. Preparing the data

The remainder respondents (30 of the 39) that filled out the questionnaire (partially) consistent are listed beneath in table 8. In this table the three municipal characteristics are listed as discussed in the literature review. These 30 respondents will be categorized within the various groups determined for each influencing factor. The second column of this table presents the number of inhabitants in the particular municipality and the group it belongs to (1: small, 2: medium small, 3: medium large, 4: large) ("CBS - Gemeentelijke indeling op 1 januari 2015," 2015). The third column presents the estimated population growth of the particular municipality for the coming ten years and the group it belongs to (1: shrinkage, 2: stagnation, 3: growth) ("PEARL Light," 2015). The final column presents the defined organization structure as retrieved from the questionnaires.

Table 8: Responding municipalities with basic characteristics

Municipality	# Inhabitants	Demographic transition	Organization structure
Aalburg en Woudrichem	27.000 (2)	6,3% (3)	decentralized
Arnhem	151.500 (4)	6,6% (3)	centralized

Bergen op Zoom	66.200 (3)	3,2% (2)	centralized
Best	29.100 (2)	9,6% (3)	decentralized
Bladel	19.700 (1)	3,6% (3)	centralized
Brielle	16.100 (1)	4,9% (3)	centralized
Cuijk	24.800 (2)	4,0% (3)	decentralized
Delft	99.900 (3)	10,6% (3)	centralized
Den Haag	507.500 (4)	5,5% (3)	centralized
Deurne	31.800 (2)	1,9% (2)	decentralized
Elburg	22.700 (2)	-0,4% (1)	decentralized
Emmen	108.000 (4)	-2,7% (1)	centralized
Hardenberg	59.900 (3)	1,0% (2)	centralized
Heemstede	26.700 (2)	0,0% (2)	centralized
Katwijk	62.700 (3)	11,6% (3)	centralized
Meppel	33.000 (2)	4,6% (3)	centralized
Noord-Beveland	7.500 (1)	2,7% (2)	centralized
Oirschot	17.400 (1)	2,9% (2)	decentralized
Oss	85.200 (3)	3,5% (3)	centralized
Purmerend	79.400 (3)	-1,0% (1)	centralized
Roermond	56.600 (3)	2,5% (2)	decentralized
Rucphen	22.000 (2)	-1,8% (1)	decentralized
Schiermonnikoog	900 (1)	11,1% (3)	decentralized
Tiel	41.600 (2)	5,5% (3)	decentralized
Veghel	37.800 (2)	2,9% (2)	centralized
Waalwijk	46.800 (2)	4,1% (3)	decentralized
Wierden	24.000 (2)	0,4% (2)	decentralized
Woerden	50.500 (3)	3,8% (3)	centralized
Woudenberg	12.100 (1)	9,9% (3)	decentralized
Zwolle	123.500 (4)	9,3% (3)	centralized

As can be seen from this table above in every defined group of municipality sizes useable responses were retrieved. For the groups within the demographic transition this counts as well, all three groups are represented by responses. The last factor influencing the decision behavior is the organization structure. As can be seen no municipality which has a real estate company responded. Only the municipalities with a centralized or decentralized responded. Since there is no respondent with a real estate company this category will be left out of this research study. Beneath in table 9 an overview is given on the number of retrieved respondents per group, the number of municipalities in the Netherlands in that corresponding group and a response rate. The groups 'large municipalities' and 'shrinking municipalities' have four respondents. The response rate of the shrinking municipalities is 2,6% since there are many municipalities which have deal with a declining demographic transition in the coming ten years.

Table 9: Number of respondents per category and response rates

Factor	Category	#respondents	#municipalities in the Netherlands	Response rate
	Small	6	129	4,7%

Size of municipality	Medium small	13	189	6,8%
	Medium large	7	45	15,5%
	Large	4	27	14,8%
Demographic transition	Shrinkage	4	152	2,6%
	Stagnation	9	129	7%
	Growth	17	109	15,6%
Organizational structure	Centralized	13	-	-
	Decentralized	30	-	-

4.4.4. Processing the data

The final step in preparing the data for a thorough analysis on the results is to prepare the various weights for each defined category. In order to make a proper analysis on the results the various means of each pairwise comparison will be computed. These means will serve as input for the AHP calculation method to compute the weights of the (sub) criteria for every category. This mean is calculated via the geometrical mean method, as stated previously. These geometrical means on the pairwise comparisons are used for the AHP calculation to find out the different weights for each individual (sub) criteria. Every consistent set within the various categories will be taken into account for the geometrical mean calculation. In the table below, table 10, an overview is given on all of the geometrical mean calculations performed in this research. All of the bold cells are taken into account for computing the geometrical mean.

Table 10: Overview of categories calculated geometrical means in

Social real estate	<i>Organization structure</i>	Decentralized organization
		Centralized organization
	<i>Size of municipality</i>	Small < 20.000
		Medium small 20.000-50.000
		Medium large 50.000-100.000
		Large 100.000 <
	<i>Demographic transition</i>	Shrink < 0%
		Slow growth 0% - 3,4%
		Strong growth > 3,4%
Own housing real estate	<i>Organization structure</i>	Decentralized organization
		Centralized organization
	<i>Size of municipality</i>	Small < 20.000
		Medium small 20.000-50.000
		Medium large 50.000-100.000
		Large 100.000 <
	<i>Demographic transition</i>	Shrink < 0%
		Slow growth 0% - 3,4%
		Strong growth > 3,4%
Commercial real estate	<i>Organization structure</i>	Decentralized organization
		Centralized organization
	<i>Size of municipality</i>	Small < 20.000
		Medium small 20.000-50.000
		Medium large 50.000-100.000

	<i>Demographic transition</i>	Large 100.000 <
		Shrink < 0%
		Slow growth 0% - 3,4%
		Strong growth > 3,4%

All of the geometrical means are presented in appendix 5. These geometrical means on the pairwise comparisons serve as input on the AHP analysis to calculate the different weights of every (sub) criteria. These weights are presented in appendix 6 (global weights and local weights) and will be discussed in the following subparagraph.

4.5. Results from data analysis

The weights as calculated in the previous paragraph and as displayed in appendix 6 are discussed in this paragraph. The most important and explicit differences and similarities between categories within the factors that influence the decision behavior will be elaborated on. First the weights of the (sub) criteria per type of real estate will be discussed after which a more in depth analysis will be made on the most noticeable weights. These will be analyzed with the three remaining influencing factors (size, demographic transition, and organizational structure of a municipality). The final two sub paragraphs will formulate an overall conclusion on the results analyzed. A discussion is held on the results in the context of the data analysis.

4.5.1. Differences between types of real estate

Below in figure 15 an overview is given of the weights derived from all of the consistent sets of pairwise comparisons per criteria. As can be seen in this table there are some major differences concerning the different types of real estate. The strategic perspective for social real estate is considered the most important perspective. The financial perspective is barely important for social real estate, i.e. the considerations from financial perspective play a minor role in decisions around social real estate. The three perspectives within own housing real estate are all relatively average, the user perspective and the financial perspective are equally important and more important than the strategic perspective.

Within commercial real estate the financial perspective is the major perspective. The user perspective on commercial real estate is considered relatively low, i.e. the most important reasons to obtain or maintain a commercial real estate object is for added values, as seen from the financial perspective.

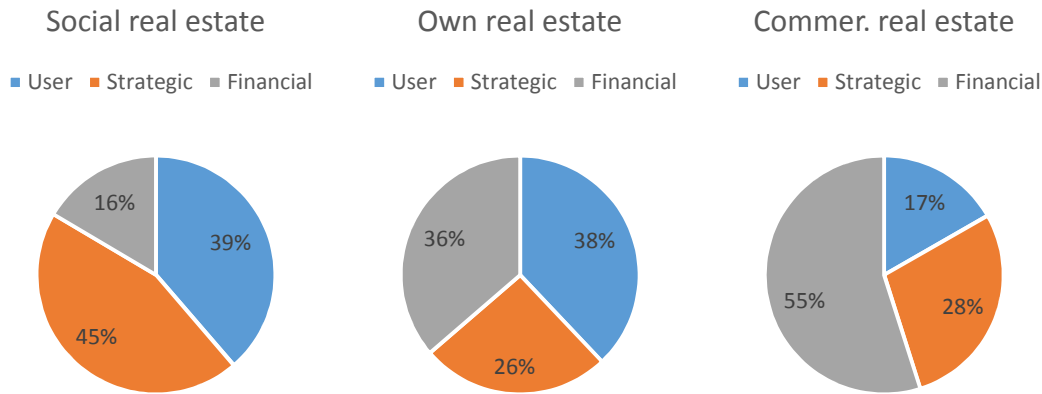


Figure 15: Weights of main criteria per type of real estate

Below in figure 16 an overview is given of the global weights of the sub criteria divided per type of real estate. As can be seen the added value improving productivity is relatively high for social real estate. The reason for this can be that policy makers are more focused on reaching their goals and targets which results in a businesslike approach towards social real estate.

The added value user satisfaction is relatively high for own housing real estate compared to the other two types of real estate. An explanation for this could be that these decisions and this type of real estate affect the decision makers and their co-workers directly. Therefore, they acknowledge the need of a relatively high user satisfaction.

The added value is seen as rather unimportant for every type of real estate. This can be due to the fact that culture is a more vague definition and the effects of improving the culture are hardly recognizable.

The added value flexibility is seen as highly important for social real estate. Municipalities acknowledge that the municipality might change over time as well as the core tasks and the policy of the municipality. This may affect especially the social activities and therefore the social real estate. A high importance of flexibility is therefore required.

Another added value which is considered as relatively unimportant for every type of real estate is the supporting image. This may be caused by the idea that the municipality does not want to spent excessive amounts of (public) money on highly aesthetic real estate objects.

The added value innovation is rather important for social real estate as well. This sub criteria is highly important due to the core tasks a municipality has in facilitating several services for the society. A good education and sports facilities will contribute in the wellbeing and health of the society as a whole.

The added values that are considered from the financial perspective are rather high for commercial real estate. From these three added values the cost reduction added value is considered as the most important sub criteria. For all three types of real estate.

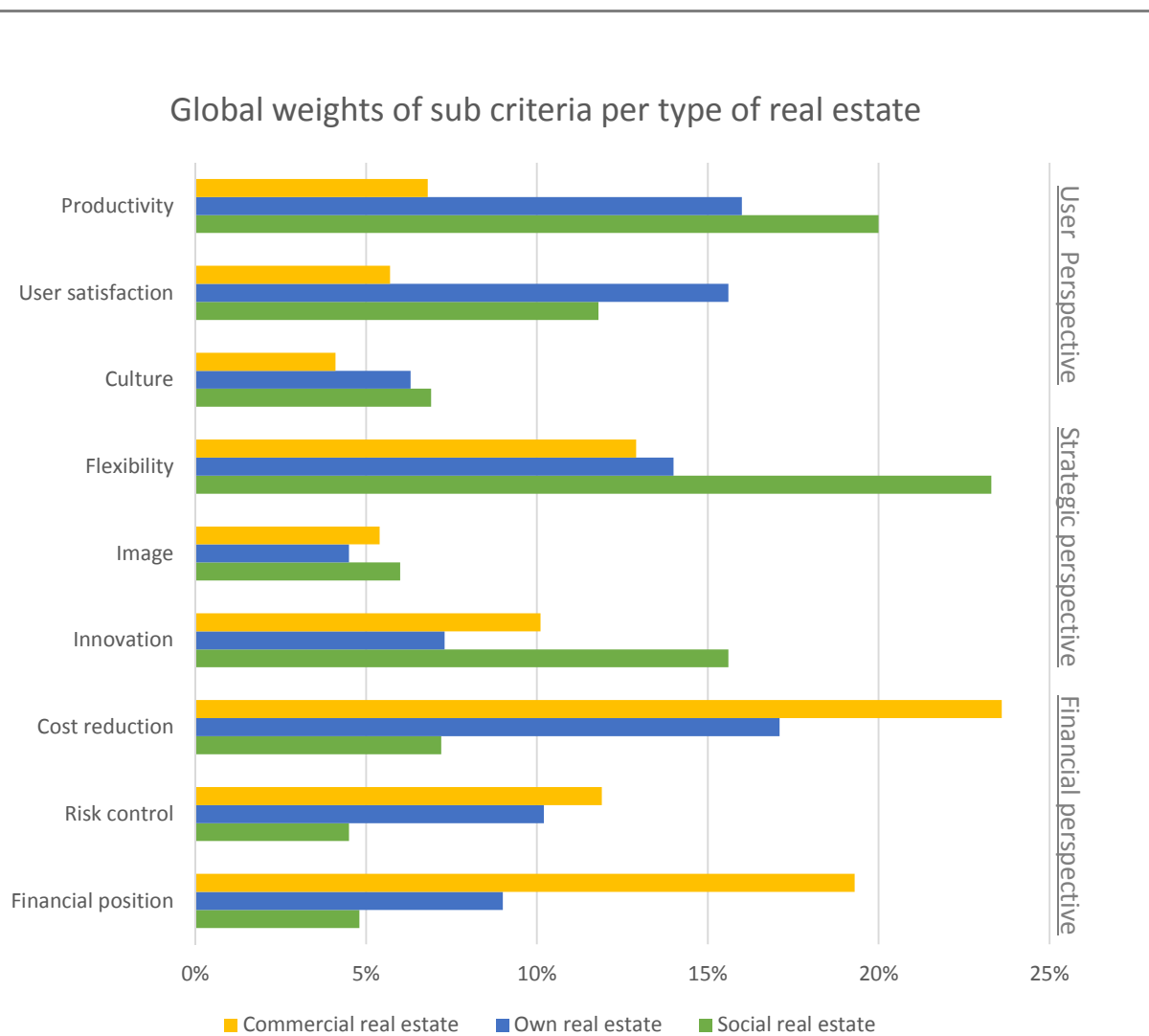


Figure 16: Global weights of sub criteria per type of real estate

4.5.2. Social real estate

Main criteria; perspectives (Appendix 6)

The most noticeable weights for social real estate are the high importance of the user and strategic perspective. This high user importance can be found back in the small municipalities (53%) and the medium large municipalities (54%). The medium small municipalities however have a relative low importance for the user perspective (25%). A reason for this could be is that small municipalities are small communities where one knows one another. A too strong focus on the financial or strategic perspective can lead to complaints from direct acquaintances. The medium large municipalities might consider the users as the most important perspective for social real estate since this is for their society. They often have a larger budget and are not willing to cut the budget at every cost.

This same pattern can be found back in the organization structure as well where the centralized organizations give a higher importance to the user perspective (49%) than decentralized organizations (34%). Another cause for this difference is that a decentralized organization has a tighter budget per department, e.g. education department. Within the factor demographic transition one can see that the growing and shrinking municipalities rate the user perspective rather high (49% and 53%) and the stagnating municipalities rather low (23%). An explanation for this could be that a stagnating region is rather satisfied with the

current situation and will try to use the real estate in a more efficient way with less costs. A growing region can obtain a more laid back approach, especially for the financial perspective. The region will grow which affects the real estate market in a positive way and therefore the social real estate of the municipality as well. The shrinking regions are aware of their declining situation, however if they keep decreasing their real estate portfolio and keep cutting expenses on the real estate objects the user will be the victim of this policy. That is why the shrinking municipalities value the user perspective for social real estate rather high.

The most remarkable added values for social real estate are the productivity in relation with the user satisfaction, the flexibility, and the innovation.

Added values within the user perspective (Appendix 6)

When looking to the local weight of productivity as well as to the global weight of productivity this increases as the size of the municipality increases and the weight of user satisfaction decreases. This can be explained that larger municipalities have a larger real estate portfolio, therefore they have more distance towards the end user. They see it more as a task they need to execute and do not have that much contact with the end user. This results in a more businesslike approach, the decision makers make sure that the activities taking place in social real estate are meant to be taking place there. The user satisfaction is then less important.

This can be found back in the organization structure as well. This can be caused by the more professional approach from this organization where they want to make sure that the real estate object is in line with the function accommodated in it, the decentralized organization are looking more to create a user friendly object.

The user satisfaction for stagnating municipality is valued rather low (6%). This can be caused by the stronger focus on improving the real estate in the long term, as well as from the financial perspective as from strategic perspective.

Added values within the strategic perspective (Appendix 6)

When looking to the local weights of the sub criteria flexibility and innovation the following can be noticed. A decrease of the importance of flexibility when the size of the municipality increases. It is likely to assume that flexibility will play an important role for smaller municipalities since the real estate portfolio is not that big that it can adequately adapt to changes. Therefore, the real estate objects need to have a high amount of flexibility. In that way an expansion or a shrink of the function accommodated in the real estate can relatively easy be solved with adapting the real estate object where a large municipality can search the solution in the entire portfolio.

4.5.3. Own housing real estate

Main criteria; perspectives (Appendix 6)

The second type of real estate discussed is real estate used for own housing. The user perspective is relatively high for shrinking municipalities (64%). Centralized organizations give a high importance to the user perspective as well (45%). A reason for this could be that centralized organizations see their human resources as greatest asset, they are trying to keep them within the organization by facilitating proper real estate. The housing for the direct services of the municipality with a decentralized organization are managed by one

department, the past years many budget cuts have been made and a more strict budgeting policy on the own housing of the municipality might have been a result from that. This leads to a stronger focus on the financial perspective which causes a lower focus on the user perspective. A centralized organization has more ways to make the budget of the department complete by cutting expenses on other real estate for example.

The added values that are most behave the most noticeable among the different factors for own housing real estate are productivity, user satisfaction, flexibility, cost reduction, and risk control.

Added values within the user perspective (Appendix 6)

The larger municipalities adopted a more businesslike reasoning towards their real estate which results in a higher importance of the productivity (24%) and a lower importance of the user satisfaction compared to smaller municipalities (10%). The high productivity weight (18%) of the centralized organization can be explained by the fact that these organizations obtained a more professional approach towards the real estate and are therefore focusing more on the productivity than on user satisfaction and the culture.

Added values within the strategic perspective (Appendix 6)

Two other notable weights are the sub criteria flexibility and innovation, flexibility is relatively low where innovation is rather high. The need for flexibility is less present since the growing regions will at least remain the same size of their services and they might even expand their services. The weight of innovation can be explained that the region will grow which means more inhabitants which leads to more work for the direct services of the municipality. An innovative setting can contribute to live up to this growing demand with the same amount of resources.

Added values within the financial perspective (Appendix 6)

The added values cost reduction and risk control are related to the size of the municipality as well. The local weights of cost reduction reduces when the size of the municipality increases. The risk control makes the opposite movement, an increase with the increase of the size. A small municipality will feel the effects of expensive own housing real estate more than large municipalities will (due to the fact that small municipalities have a smaller real estate portfolio). A cost reduction made on the own housing real estate will have a bigger impact on the total budget spending of a small municipality compared to a large municipality. It is likely to assume that a (too) strong focus on cost reduction can lead to an increase of risks.

4.5.4. Commercial real estate

Main criteria; perspectives (Appendix 6)

The last type of real estate discussed is commercial real estate. The strong importance for the financial perspective can be considered noticeable. This high importance of the financial perspective can be seen in larger municipalities as well (52% & 47%). The centralized organizations acknowledge this long term vision on this type of real estate as well looking to the relatively low importance of the user perspective (8%). This low importance of the user perspective can be identified at the larger municipalities as well (7% & 10%). These municipalities look in a more professional and businesslike way to this type of real estate. The shrinking municipalities value the strategic perspective as the most important (64%). A high

importance of strategic perspective might be due to the reason to adopt a commercial real estate in the portfolio. These municipalities do not see themselves as investors since these local real estate markets are declining. The only motivation to deal with commercial real estate might therefore be from mainly strategic perspective.

The added values which can be considered noticeable are productivity, user satisfaction, flexibility, cost reduction and financial position.

Added values within the user perspective (Appendix 6)

The added value user satisfaction is considered relatively unimportant by larger municipalities as well as by centralized organizations. This might be due to the fact that these municipalities do not see themselves as a so called charity fund, they must have a more professional approach towards these marketable object and obtain a market conformity renting price.

Added values within the strategic perspective (Appendix 6)

The added value flexibility is considered relatively high by shrinking municipalities. As well as with smaller municipalities. This may be caused by the fact that the budgets and flexibility of the real estate portfolio of these municipalities is rather small having a commercial real estate object in the portfolio should contribute in such a way that other users can be facilitated in it as well and the function of the object can change easily.

Added values within the financial perspective (Appendix 6)

The added value improving the financial position is considered rather low by centralized organizations and larger municipalities. They focus more on reducing the costs of the real estate object than that they worry about the investment possibilities of this object. They do not see themselves as real estate investors and are therefore focusing on other added values when it considers commercial real estate.

4.5.5. Conclusion on data analysis

Influencing factor; type of real estate

Looking to the overall weights of the different types of real estate it is recognizable that social real estate is considered by municipalities as a necessary service they need to provide. This can be found back in the high weight for the strategic perspective and the productivity. The user satisfaction for own housing real estate is rather high which could imply that the department responsible for the own accommodation acknowledge the necessity of keeping the employees of the own organization satisfied as mentioned by various researchers (Zwart, 2014), (Nourse & Roulac, 1993). Commercial real estate can be considered as real estate which is used under strict circumstances. The financial perspective is weighed rather high and a motivation as seen from the user perspective might be that the culture has to improve with the presence of commercial real estate, e.g. an obsolete and vacant commercial real estate object which affects the surrounding area in a negative way.

Influencing factor; organization structure of municipality

A centralized organization can be considered as a more professional organization, a strong focus on productivity and higher awareness of the financial possibilities and limitations towards the different types of real estate emphasizes this professional approach. As stated in the third chapter by Loozen et al. and De Wit a more centralized real estate department will

lead to a more professional approach towards the real estate of the municipality (Loozen & Zijlstra, 2011), (De Wit, 2007).

Influencing factor; size of municipality

This professional approach can be found back in the different sizes of the municipalities as well. Several relations show that the larger the municipality becomes the more important productivity is and the awareness of financial possibilities and limitations of the different types of real estate is pronounced.

Influencing factor; demographic transition of municipality

Within the demographic transition category a clear pattern can be identified where the stagnating municipalities are more focused on the performance of the real estate. The growing regions experience less pressure since the local real estate market is growing which will affect the real estate of the municipality in a positive way. The shrinking regions are as well aware of their declining situation in the local market. However, as can be recognized from the assigned weights to the different (sub) criteria they are not willing to let the financial perspective become too important. They acknowledge that the social real estate has to live up to a minimum standard as well as the real estate used for own housing. These municipalities have a strong aversion towards commercial real estate due to the declining local real estate market and the strong negative influence on this type of real estate.

4.5.6. Discussion on data analysis

There are several remarks which can be addressed when interpreting the results from the data analysis. This data analysis is based on 30 questionnaires. In some cases the number of available sets per category within a factor was rather low. The representative group of some of the categories can be considered relatively low as well, e.g. the number of shrinking municipalities which responded compared to the total amount of shrinking municipalities (2,6%).

The way the questionnaire is designed is important as well on the outcome of the data analysis. As stated before with the pairwise comparisons in the questionnaire both criteria are situated on one side of the answering fields. A better design would be when the criteria are both on an individual side (one left, one right) as depicted below in figure 17. A higher amount of consistent sets could then be achieved.

Which perspective do you think is more important?

	9	7	5	3	1	3	5	7	9	
User perspective	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	Strategic perspective
User perspective	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	Financial perspective
Strategic perspective	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	Financial perspective

Figure 17: Proposed layout for questionnaire

A third remark that needs to be addressed is that the interpretation of the definitions might be different by each respondent. This difference in interpretation can lead to a differentiation in answers.

4.6. Case study

A case study will be executed and discussed in order to validate the AHP model and the added values and selling methods as defined in the literature review. First the procedure of giving a score on every individual alternative (real estate object) for every sub criteria (the added values) and the marketability is discussed. Paragraph 4.6.2. will discuss the selected alternatives and what information should be available for the expert to rate all of the alternatives.

The case study is done in the municipality of Eindhoven. This municipality is accessible for the researcher to collect background information for. Eindhoven has approximately 220.000 inhabitants (large municipality) ("CBS - Gemeentelijke indeling op 1 januari 2015," n.d.) and has an estimated population growth of 3,9% (growing demographic transition) in the coming ten years ("PEARL Light," 2015). The organization structure of the municipality can be characterized as a centralized organization structure ("Eindhoven | Gemeentelijke organisatie," 2014). Selecting representative data sets for Eindhoven from the data set discussed in the fourth and fifth paragraph would be a selection of the following criteria: Large municipalities with a centralized organization structure and an above average population growth. However, if these selection criteria are used to form the geometrical means for Eindhoven the following amount of available sets of comparisons will be available as shown in the first column of table 11. As can be seen there are no available consistent sets for the sub criteria within the user perspective for any type of real estate. Since the population growth is rather close to the national average the selection criteria of demographic transition will be expanded with 'growth below national average' (which is a growing demographic transition) as well. This will lead to the available amount of sets as shown in the second column, table 11. These criteria lead to the same amount of sets as in the first column. Therefore, the selection criteria 'size of municipality' will be expanded as well with the middle large sized municipalities. This will lead to the following amounts of available consistent sets in the third column, table 11.

Table 11: Number of cases per selection of criteria for the three types of real estate combined

N cases per selection of criteria	Central org. struct. Size: Large Dem. Trans.: growth above average	Central org. struct. Size: Large Dem. Trans.: growth below and above average	Central org. struct. Size: Large, medium large Dem. Trans.: growth below and above average
Three main Perspectives	6	6	15
Sub criteria within user perspective	0	0	9
Sub criteria within strategic perspective	1	1	7
Sub criteria within financial perspective	4	4	8

The weights of the criteria and sub criteria (respectively the three perspectives and nine added values) will be based on the sets selected with the selection criteria used in the fourth column of table 11. The geometrical means of these numbers are computed and processed in the AHP calculation method (appendix 7). The weights of the sub criteria (added values) need to be multiplied with the corresponding weight of the perspective the added value is related to in order to obtain the global weights for the sub criteria. The global weights of every criteria and sub criteria are presented below in table 12:

Table 12: Weights of criteria for Eindhoven study case

(Sub) criteria	Weights for social estate	Weights for real own housing real estate	Weights for commercial real estate
User perspective	44,7%	33,9%	7,9%
Strategic perspective	42,1%	21,6%	38,8%
Financial perspective	13,2%	44,5%	53,3%
Improving productivity	20,5%	15,3%	5,1%
Increasing user satisfaction	14,8%	13,9%	1,6%
Improve culture	9,4%	4,6%	1,2%
Improving flexibility	20%	9,4%	19,3%
Supporting image	4,3%	3,7%	8,3%
Increasing innovation	17,8%	8,6%	11,3%
Reducing costs	6,9%	20,%	23,2%
Controlling risks	3,1%	12%	11,9%
Improving the financial position	3,2%	15,5%	18,1%

4.6.1. Scores for sub criteria

Lindholm et al. and Scheffer et al. discuss several measurable terms which can measure the added value by corporate real estate (Lindholm & Leväinen, 2006), (Scheffer et al., 2006). These measurable terms are listed in appendix 8 and are used to measure the added value of the real estate objects discussed in the case study.

All of the objects need to be scored by an expert. To make the grading procedure unambiguous grading scales are being made in order to support the expert. The grading scales go from 0 to 10, where a 0 represents a very low score and a 10 a very high score. Below, for every sub criteria (added value) two different scenarios are given. The first scenarios represent the worst scores and the second scenarios represent the highest score.

Improving productivity:

0: The building is quite generic and does not seem to fit the needs of the function it facilitates.

10: The building is very specific adjusted to the function it facilitates

Increasing user satisfaction

0: Users of the object are not satisfied. They do not like to come here due to an uncomfortable climate in the building or an unfriendly appearance of the object

10: Users are very satisfied. They do like to come here due to a comfortable environment and a friendly appearance of the real estate.

Improve culture:

0: There is no culture present in or around the real estate object, people do not feel united when they are here

10: There is a strong united feeling. People are coming here to meet and show similarities in interests.

Improving flexibility

0: The building has a rigid building structure and there is no room for expansion on the current plot. Next to that the development plan is quite precise and allows no changes.

10: The building has a column structure which makes it highly flexible and there is much space left for expanding the real estate object. The development plan is very broad and many other functions can be placed in this real estate object.

Supporting image

0: The object its appearance is not representative for the function it facilitates and it is located on a rather bad location considering the function of the real estate.

10: The object its appearance represents the function in a strong way and it is located on a good visible location considering the function of the real estate. The real estate object might have a monumental status which contributes to the image of the object.

Increasing innovation

0: There is no innovative setting, no interferences between different type of users and the real estate does not allow radical changes.

10: There is a strong innovative setting, many interferences between different types of users occur and the real estate allows radical changes.

Reducing costs

0: The maintenance state of the real estate object is rather poor and the object scores rather low on the energy index which results in a poor energy label.

10: The building its maintenance state is exceptionally good, it is a new developed building or a recently renovated real estate object and has a high energy label

Controlling risk

0: There is a single tenant in the real estate object which operates in a risky market, the location the real estate object is situated rather badly due to multiple circumstances (e.g. high criminal rate in the area).

10: There might be multiple tenants in the real estate object whom all operate in a steady market. The location of the real estate object is a safe location due to multiple circumstances (e.g. a school in a neighborhood with a steady forecasted child birth rate)

Improving the financial position

0: The real estate object is highly unmarketable because it is very specific and it is located on a very poor location.

10: The real estate object is rather marketable due to its multi functionality and it is located on a very promising location.

4.6.2. Rating the alternatives

For this case study 17 real estate objects within the municipality of Eindhoven are selected. The aim is to have multiple real estate objects within every type of real estate. To be able to compare the same functions of real estate with each other every selected function consists of multiple real estate objects. A selection of real estate objects has been made within (A) own housing real estate, (B) primary schools, (C) sports accommodations, (D) community centers, and (E) cultural real estate. No available commercial real estate objects were found and this type of real estate is therefore not taken into account in this case study.

To obtain background information on every real estate object, multiple databases and other sources are addressed. The following data has been retrieved from various sources:

- Address (google maps)
- Function/zoning plan ("Eindhoven - Onherroepelijke bestemmingsplannen," n.d.)
- Monumental status ("Eindhoven | Monumenten," 2015)
- Building year ("BAG Viewer," n.d.)
- Net floor space ("BAG Viewer," n.d.)
- Building structure (photo/observation)
- Expansion possibilities (google maps/photo)
- Indication of the maintenance state (photo/observation)
- Energy label ("Zoek uw energielabel," n.d.)

The social real estate objects that are selected for this case study are:

- Primary school at Reigerlaan 3
- Primary school at Barrierweg 19
- Primary school at don Boscostraat 2
- Primary school at Hemelrijken 310
- Rowing association Beatrix at Kanaaldijk-Noord 61
- Sports hall at Savoiepad 14
- Sports hall at Vijfkamplaan 12
- Sports hall at Weegschaalstraat 1
- Community center at Iepenlaan 40
- Community center at Koenraadlaan 98
- Community center at Lekstraat 4
- Community center at van der Werffstraat 14
- Museum van Abbe at Bilderdijklaan 10
- Music center De Effenaar at Dommelstraat 2
-

The real estate objects used for own housing selected for this case study are:

- Municipal office at Frederik van Eedenplein 1
- City office at Stadhuisplein 10
- Tourist information office at Stationsplein 17

In the appendix, appendix 9, an overview is given of the available background information for every real estate object. On these sheets the scores for the nine sub criteria are given. Below, in figure 18, an overview is given of the location of the selected real estate objects for the case study.

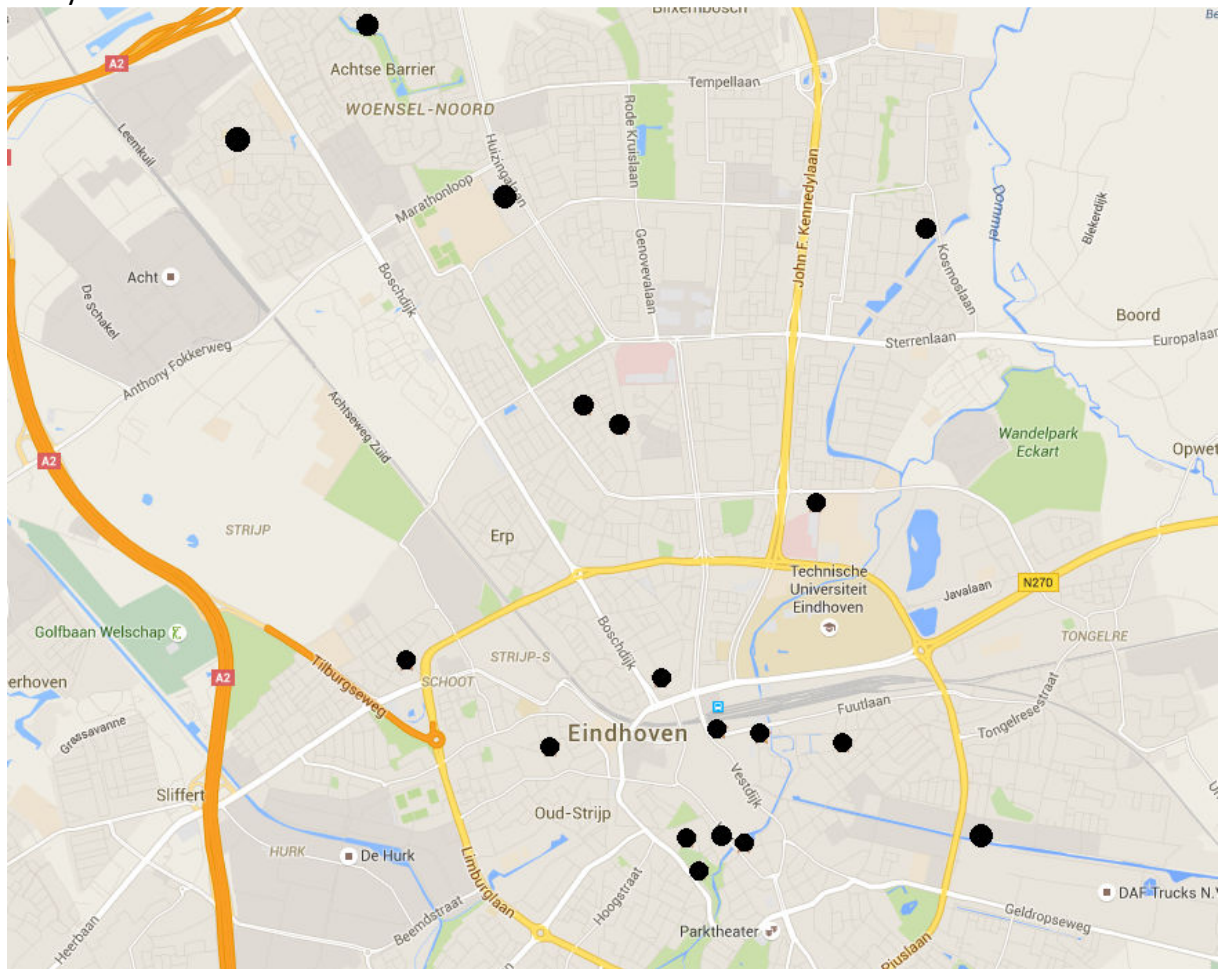


Figure 18: overview map of selected real estate objects for study case

4.6.3. Results of case study

The marketability of the selected real estate objects can be defined based on the scale as discussed in the third chapter.

- The primary schools are rated in essence with a 7. However, the Reigerlaan has a monumental status which makes it less marketable and is therefore rated with a 6
- The Hemelrijken is a school located near the city center and there multiple tenants located in the object, this high flexibility results in a slightly higher marketability (8)
- The Barrierweg is rated with a 7, since it is a regular school building
- The Don Boscostraat is rated with a 7, since it is a regular school building
- The sports accommodation Savoiepad has a relatively low marketability of 5
- The sports accommodation Weegschaalstraat is similar to Savoiepad and therefore rated with a 5
- The vijfkamplaan is rated with a 4 due to its large size
- The kanaaldijk Noord is an old warehouse used as a sports accommodation, this will be rated as an outdated vacant office (13).
- The community centers are relatively marketable objects. The van der Werffstraat is rated slightly higher than a decayed office space in a residential area (18)

- The Iepenlaan is considered the same as the van der Werffstraat (18)
- The Koenraadlaan is considered the same as the above mentioned community centers (18)
- The Lekstraat is a rather old real estate object and will therefore be rated as a decayed office space (17).
- The cultural real estate objects are rather specific which makes them less marketable. Therefore, they are ranked as an object less marketable than a school and more marketable than a municipal swimming pool (due to its location). The Bilderdijklaan is therefore rated with a 5
- The Dommelstraat is considered a 6
- The Stationsplein is a small shop located between the city center and the central station. This leads to a high marketability rate of 17 (almost as marketable as a parking garage in a city center).
- The Stadhuisplein is located in the city center and is designed as an office. This is rather marketable and therefore rated with 18.
- The third object in this category is the Frederik van Eedenplein. This real estate object is located near the city center in a park and is designed as an office. However, the office is vacant and rather old which results in a slightly better marketability than a standard outdated vacant office, which results in a rate of 14.

The scores for every real estate object are assigned by the researcher based on the available information as presented in appendix 9.2. On these overview sheets the individual scores per added value are given. These added values are multiplied by the weights of every added value as given in table 12 in this chapter. The weights of the sub criteria for social real estate are used for the primary schools, sports accommodations, community centers, and cultural real estate objects. The weights of the sub criteria for own housing real estate are used for the city office, the tourist information office, and the municipal office.

The assigned rates per sub criteria are presented in appendix 9.2 and are discussed in this appendix as well. The sum of these scores generate the total added value of each individual object. These added value scores are presented below in table 13. As can be seen in the table the added value scores of the real estate objects are all in a range between 3,5 and 7, there are no extreme scores such as a 1 or a 9. An explanation for that could be that several characteristics of a real estate object have a negative effect on one added value and affect another added value in a positive way, e.g. the specificity of the real estate object influences the productivity as well as the flexibility. Another explanation might be that the scores given to the added values per object are not having extreme values either. This will result in an averaged score of the overall scores.

Table 13: Overview of overall scores of added value of the real estate objects from the case study

Function of real estate	Address	Added value	Marketability
Primary school	Reigerlaan 3	4.88	6
	Barrierweg 1	6.96	7
	Don Boscostraat 2	5.54	7
	Hemelrijken 310	5.66	8
	Kanaaldijk Noord 61	3.99	13
Sports accommodation	Kanaaldijk Noord 61	3.99	13

	Savoiepad 14	4.88	5
	Vijfkamplaan 12	5.91	4
	Weegschaalstraat 61	5.25	5
Community center	Lekstraat 4	4.74	17
	Van der Werffstraat 14	4.96	18
	Iepenlaan	6.64	18
	Koenraadlaan 98	5.05	18
Cultural real estate	Bilderdijklaan 10	6.68	5
	Dommelstraat 2	5.6	6
Own housing real estate	Stationsplein 17	5.76	17
	Stadhuisplein 10	6.96	18
	Frederik van Eedenplein 1	5.06	14

In the figure below, figure 19, the matrix marketability versus added value is depicted. Several real estate objects from the case study are placed in this matrix. The following real estate objects are selected and discussed: Kanaaldijk Noord 61, Stadhuisplein 17, Reigerlaan 3, and Bilderdijklaan 10. As can be seen the Kanaaldijk Noord is rather marketable and the value this object adds to the municipal organization is rather low. Since it adds no significant value to the organization the recommendation is to sell the object. A proper selling method would be via a real estate broker or via a public sale without any preconditions.

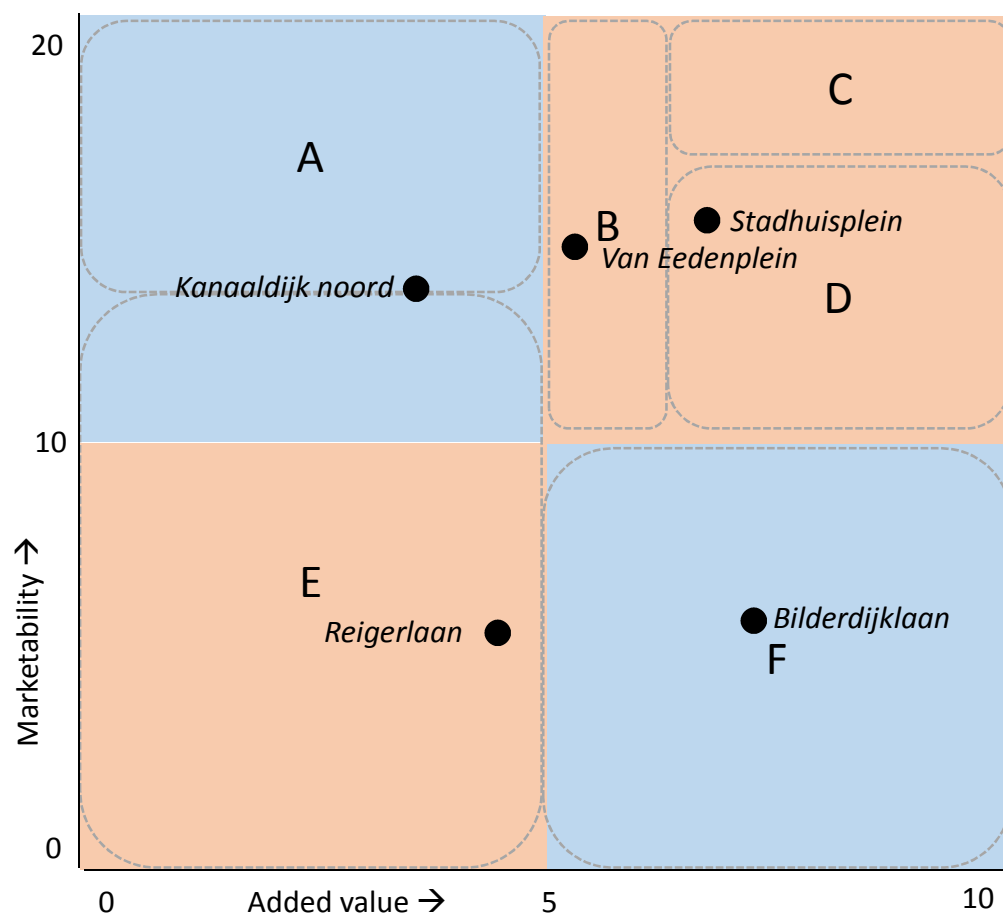


Figure 19: Matrix marketable versus overall added value with four real estate objects

Frederik Eedenplein, is a vacant office building formerly used by the technical services of the municipality ("Nog 5 kandidaten voor TD-gebouw Eindhoven," 2015). This object is placed in the top right quadrant which implies that the municipality should keep it if they will use it for a time span of longer than 10 years. At the moment this office building is vacant and therefore able to be sold. The bidding procedure suggested by the case study is (B) public sale with unconditional and/or conditional bidding. This is the selling method used for this real estate object by the municipality in practice ("Nog 5 kandidaten voor TD-gebouw Eindhoven," 2015)

Stadhuisplein 10, the city office, is rather marketable as well. However, the added value of this real estate object is relatively high as well. Therefore, this object is placed in the top right quadrant of the matrix. Objects located in this quadrant that are used for an estimated time span of longer than ten years should be kept in the real estate portfolio of the municipality.

The Bilderdijklaan 10, the Van Abbe museum, has a relatively high added value. The marketability of this object is low which locates this object in the bottom right quadrant of the matrix. The recommendation for objects located in this quadrant is to keep the real estate in the portfolio.

The final object discussed in figure 19 is the Reigerlaan 3. This primary school has an overall score for the added value of 4.88 (which is just below the borderline between the left and right side of the matrix). The marketability is rather low which locates this object in the bottom left quadrant. The general recommendation for this quadrant is to sell this object. However, if the object has a monumental status the municipality could decide to keep the real estate object. Since the Reigerlaan 3 is a monument the advice to keep this real estate object in the real estate portfolio.

4.6.4. Discussion on case study

The validity of the scores of the different real estate objects are debatable due to several uncertainties on their backgrounds. First the measurability of the added values is doubtful, the added values user satisfaction, culture, and innovation are rather difficult to measure and to grade. This has two causes, the availability of the data is lacking which causes a grading of the added value which can be questioned. Second, the added values user satisfaction, culture, and innovation are added values which are rather qualitative and are hard to measure in a quantitative way. Measurable terms mentioned by Lindholm et al. for measuring the innovation are the number of teamwork settings and the number of workstations per employee. These are time consuming parameters to measure and they do not cover the added value innovation fully.

Another important remark is the lack of a panel of experts that will be grading the real estate objects. The expertise of solely the researcher is used in scoring the added values. A panel of experts could lead to a more reliable score which helps the municipality better in making the right decisions in this process.

The final remark is that multiple functions of social real estate are examined in this case study, primary schools, sports accommodations, community centers, and cultural real estate. This research is designed in such a way that every type of real estate its added value is weighed in

the same way. However, it is likely to assume that several differences might appear when speaking of the weights of the added value for a primary school compared to the weights of the added value for a community center. Commercial real estate is not examined in this case study since no available cases could be selected. Examining this type of real estate and comparing this with the other two types of real estate might be interesting to see if the professional approach from large municipalities with a centralized organization is present in practice as well.

4.7. Conclusion

This chapter discussed two sub questions as defined in the first chapter. This research study provides an answer to these questions as given below:

- *How do these factors influence the decision behavior?*
- *How do these criteria relate to each other and what is their relative importance?*

4.7.1. How do the factors influence the decision behavior?

The four factors derived from the literature study that influence the decision behavior are: the size of the municipality, the demographic transition, the organization structure of the municipality, and the type of real estate. Several relations were identified between the size of the municipality and the weights assigned to the added values.

A more professional and businesslike approach can be identified in the large municipalities. This is the same for centralized organizations compared to decentralized organizations. The (medium) large municipalities with a centralized real estate organization approach the different types of real estate in different ways. They see social real estate as their task to facilitate, the improvement of productivity and the strategic perspective are weighed relatively high. The financial perspective has a relatively low influence on this type of real estate since the municipality is obliged to facilitate this type of real estate. The human resources within their own organization is rather important, this can be found back in the relatively high importance of the user perspective, the user satisfaction, and the culture. Commercial real estate is considered as real estate which can be used to achieve indirect positive side effects, e.g. improving the (surrounding) culture of an obsolete real estate object.

The different groups within the demographic transition of the municipality show a notable result. The shrinkage regions seem to be aware of their situation where a decline is taking place. They seem to have an adverse approach towards commercial real estate since this market is risky and declining. Strongly growing regions experience less pressure since the local real estate market is growing which will affect the real estate of the municipality in a positive way. It is likely to assume that the shrinking regions and the strong growing regions need to pay more attention to their real estate portfolio since their municipality is subject to significant changes which leads to an adaption of the real estate portfolio to the changing situation. A stagnating region only has to manage their current real estate portfolio closely since their situation is not changing the real estate portfolio does not require significant changes either.

4.7.2. *How do the criteria relate to each other?*

As stated above, the defined factors influence the relative importance very strong so that a generic relative importance cannot be identified. Per type of real estate the differences are rather large per (sub) criteria. However, the added value culture and supporting image are weighed relatively low throughout every category within each factor. These added values are apparently not very important for a municipality. An explanation for this could be that the municipality does not want to spent excessive amounts of tax money on iconic real estate. The relatively low importance of culture can be caused by the fact that this added value is very hard to measure and there are no direct effects for the organization. The weights for the other criteria strongly differ per group within a factor.

This research study used the AHP research method. A characteristic of this research method is that criteria behave independent from each other and sub criteria behave independent from each other. However, as can be identified in the case study, various characteristics of a real estate object affect multiple added values. The location of the real estate object for example has its effect on the user satisfaction (good accessibility), the supporting image (a visible and high ranked location), and financial position (high market value of the ground the object is located on).

5. Conclusions

5.1. Conclusion

The main research question as defined in the first chapter is:

How could a municipality make the decision to apply the most suitable selling method onto a real estate object which does not add sufficient value to the municipal organization?

Applying the most suitable selling method onto a real estate object is based on the marketability of the real estate object and the added value of the real estate object for the municipal organization.

The added value is determined by the following perspectives and added values of real estate as depicted below in figure 20. These added values of real estate are divided in the three perspectives of public real estate management: user perspective, strategic perspective, and financial perspective.

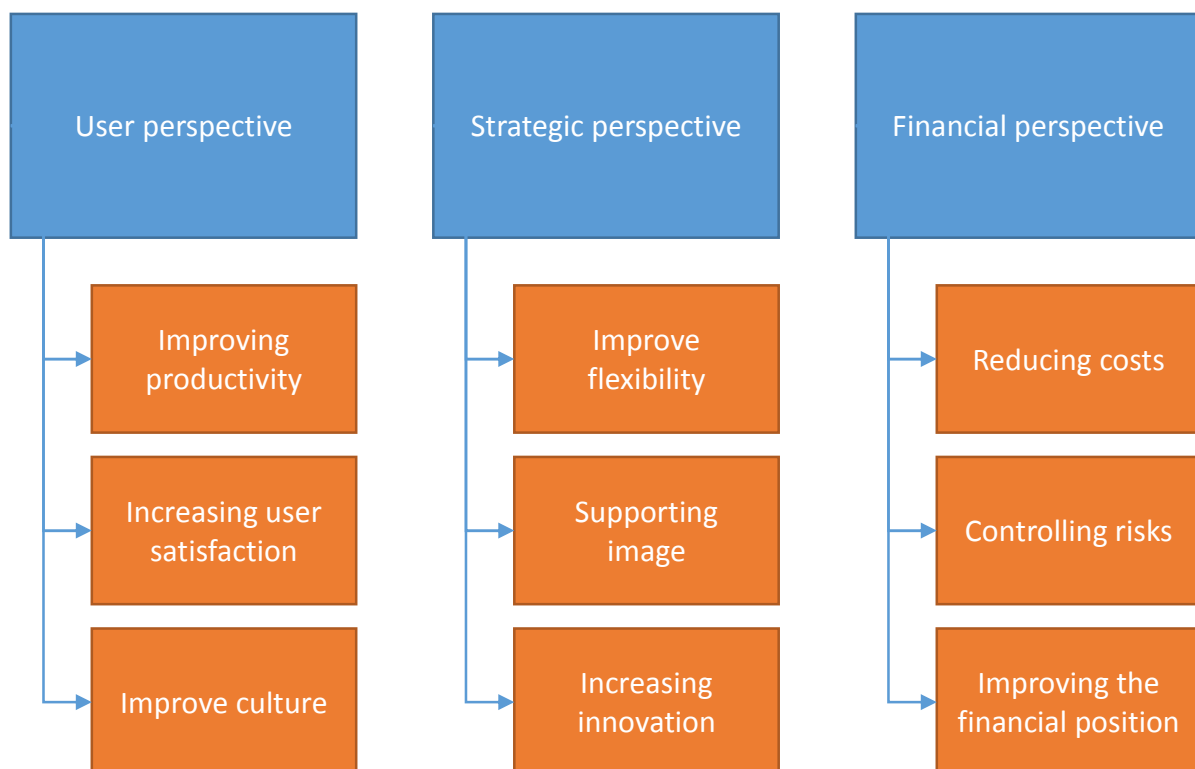


Figure 20: layout of perspectives and added values of real estate

The added value of real estate is dependent on a variety of factors: the type of real estate, the size, the organization structure, and the demographic transition of the municipality. A larger size of the municipality and a centralized organization structure result in a more professional and more business-like approach towards the real estate portfolio of the municipality. Social real estate and commercial real estate are approached in a rather business-like way.

Clear difference between the types of real estate can be identified. Social real estate is seen as a core task the municipality needs to provide to the society, the financial perspective is less

important in this situation. It is important that the real estate objects are functioning as good as possible in their main area, e.g. education in primary schools. Commercial real estate is approached as an exception to have, many strict additional demands are obtained when commercial real estate is used. The financial risk need to be considered carefully, the aim of commercial real estate is often to realize indirect positive side effects. Improving the (surrounding) culture on a short term and improving the innovation on a long term. The experience of the real estate object from the user is considered relatively important for real estate used for the accommodation of the own services. An environment is created where the human resources are seen as important, this can be seen in the high importance of the user perspective, the user satisfaction, and the culture.

If the added value and the marketability has been established the real estate object can be placed in the matrix below, figure 21. The left top quadrant and the right bottom quadrant contain the clearest recommendation. Real estate objects located in the right bottom quadrant should be kept in the real estate portfolio (F) and real estate located in the top left quadrant generally should be sold. The left bottom and right top quadrant contain more specific real estate objects. Objects located in the left bottom in general should be sold unless a special value (e.g. monumental value) gets lost. Objects located in the right top quadrant should be considered to sell if the object will be used for a short term, less than ten years. If the object will be used for a longer time than ten years the municipality should keep the object. If the recommendation is to sell the real estate object, five different selling methods can be applied on the specific object. Objects with a low added value for the municipality can be sold via a real estate broker (E) in the case of low marketability, or with a public sale with unconditional bidding (A) if the object is placed in the top left quadrant. The selling methods which can be applied upon real estate objects located in the top right quadrant are public sale with a conditional bidding (B), with a simple preselection (C), or with an unconditional bidding and an extensive preselection (D). These selling methods enables the municipality to add additional requirements and demands for the future plans of the real estate object.

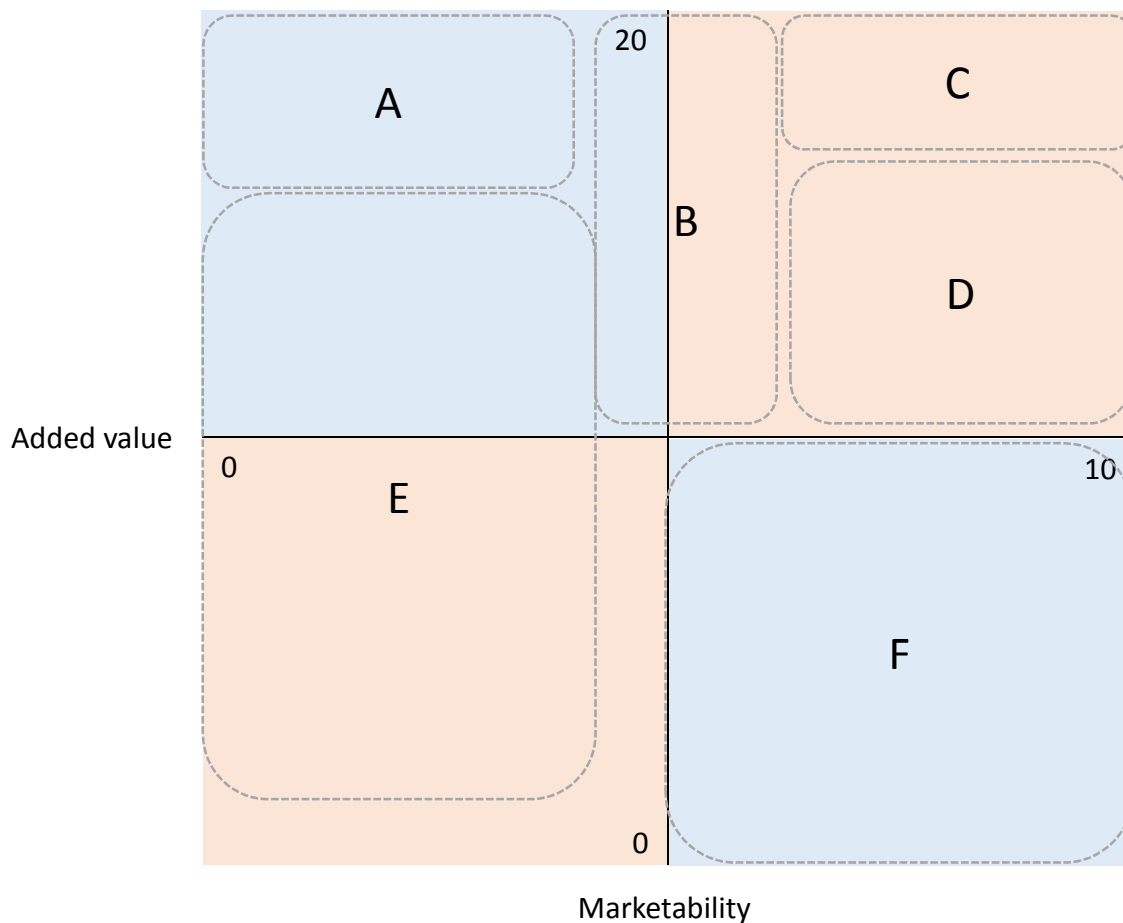


Figure 21: Matrix marketability versus added value of real estate for the municipal organization

5.2. Discussion

In this research study AHP is applied. This method turned out to work well to take into account multiple criteria in defining the added value of real estate and weighing these criteria. The added values of real estate were put into practice in this research study. This is important, because it makes it possible to validate the rather abstract theories regarding the determination of added value. In previous research studies in this field this is barely done, and the literature which has been used as reference material for this study has thus not been tested in practice.

By performing this case study, it has become clear that there is still a large gap between theory and practice. Several remarks can be made regarding the creation of the weight scores. Measuring and scoring the added values is badly performable for several of the added values, e.g. culture, innovation, and user satisfaction. These added values are rather qualitative and are hard to express in quantitative numbers. The distance between available data (which can be obtained) on real estate objects and the input required for the measurable terms is rather large. Another aspect that is left out of this study are the characteristics of the object itself, by example the location of the real estate object.

Another remark which can be made on this research study is the amount of consistent sets. Following the theory on AHP and the Consistency Rate gives a consistency ratio of 0,1. Due to the lack of sufficient consistent sets this Consistency ratio had to be adjusted to 0,15. A more

extensive data collection would suffocate in this problem. This high amount of inconsistent sets can be caused by various reasons. A reason could be that the pairwise comparison method was too complex. A live feedback on the performance of the pairwise comparison would improve this.

A last point of discussion is the ability to generalize these real estate objects with this model. As discussed, multiple respondents did not agree on this approach; they stated that every real estate object should be approached individually and different criteria have a different importance.

5.3. Recommendations

Future research could examine the relations and connections between the added values of real estate and the available data on real estate objects. A useful research method to examine this might be ANP (Analytical Network Process). This research method is much alike the AHP research method; however, this research method looks into the direct relations between variables and criteria and how these influence each other in a positive or negative way. With this method, the dependence of a characteristic, such as location, on different criteria (image, user satisfaction, financial position) is captured. One might say that this research study obtained a top-down approach where the added values were defined first, how these can be measured and eventually used for the available data. A reversed approach, bottom-up, might be an interesting approach to examine this. First the available data on real estate objects needs to be inventoried, after which the relation with the measurable terms are defined. Eventually these measurable terms define the added value. After this study, it is possible to determine which added values can contribute in defining the overall added value of real estate.

Social real estate and the social value of real estate is a relative new research topic in the field of real estate. An interesting follow-up research on this research study might be to make a distinction in the different functions within social real estate, e.g. educational functions, sports functions, cultural functions, and well-being functions. These different functions might differ from each other in the way how they add value to the municipal organization.

6. References

- Aalbers, S., & Heijnders, L. (2013, November). Enorme besparingen mogelijk op maatschappelijk vastgoed. *Vastgoedmarkt*, 22–23.
- Aardema, H., & Korsten, A. (2009). Gemeentelijke organisatiemodellen. A. Bekke, *Naar Een Collegiaal En Samenhangend Overheidsbestuur*. Den Haag: Uitgave Raad Voor Het Openbaar Bestuur. Retrieved from <http://blog.sioo.nl/wp-content/uploads/2012/04/Gemeentelijke-organisatiemodellen.pdf>
- Aragonés-Beltrán, P., Chaparro-González, F., Pastor-Ferrando, J.-P., & Pla-Rubio, A. (2014). An AHP (Analytic Hierarchy Process)/ANP (Analytic Network Process)-based multi-criteria decision approach for the selection of solar-thermal power plant investment projects. *Energy*, 66, 222–238. <http://doi.org/10.1016/j.energy.2013.12.016>
- BAG Viewer. (n.d.). Retrieved October 12, 2015, from <https://bagviewer.kadaster.nl/lvbag/bag-viewer/index.html#?geometry.x=160000&geometry.y=455000&zoomlevel=3>
- Berlin, J. W., & Lexa, F. J. (2006). An Analysis of the Buy-Vs-Lease Decision. *Journal of the American College of Radiology*, 3(2), 102–107. <http://doi.org/10.1016/j.jacr.2005.09.019>
- CBS - Gemeentelijke indeling op 1 januari 2015. (2015). Retrieved March 20, 2015, from <http://www.cbs.nl/nl-NL/menu/methoden/classificaties/overzicht/gemeentelijke-indeling/2015/default.htm>
- CBS StatLine - Gemeentelijke afvalstoffen; hoeveelheden. (2015). Retrieved October 7, 2015, from <http://statline.cbs.nl/Statweb/publication/?DM=SLNL&PA=7467&D1=168&D2=0%2c17-22&D3=a&HDR=T&STB=G1%2cG2&VW=T>
- Chinloy, P. (2013). *Alternative Investments: Instruments, Performance, Benchmarks, and Strategies*. Hoboken, NJ, USA: John Wiley & Sons, Inc.
- Cresswell, A., Burke, B., & Pardo, T. (2006). *Advancing Return on Investment Analysis for Government IT: A Public Value Framework*.
- de Brey, B. (2012, August). Visie op vastgoed; Utrechtse heuvelrug.
- Definition of “value” | Collins English Dictionary. (2015). Retrieved October 15, 2015, from <http://www.collinsdictionary.com/dictionary/english/value>
- de Jonge, H. (1996). De toegevoegde waarde van concernhuisvesting. Presented at the NSC-conference.
- de Jonge, H. (1997). Trends in corporate real estate. Presented at the Trends op de vastgoedmarkt congres, Amsterdam.
- De Jonge, H. (2010). We hebben het met elkaar veel te complex gemaakt, expert meeting over maatschappelijk vastgoed in crisistijd. *Real Estate Magazine*, 8–12.
- de Kort, P. (2007, September). *beheermonitor gemeentelijk vastgoed*. Amsterdam school of real estate, Amsterdam.
- den Heijer, A. (2011). *Managing the university campus*. Delft : Eburon Academic Publishers.
- de Vries, J. C., de Jonge, H., & van der Voordt, T. J. M. (2008). Impact of real estate interventions on organisational performance. *Journal of Corporate Real Estate*, 10(3), 208–223. <http://doi.org/10.1108/14630010810922094>
- De Wit, R. (2007a, April). gemeenten brengen hun vastgoed onder in professionele organisaties. *Vastgoedmarkt, Trends Congres*(59), 3.

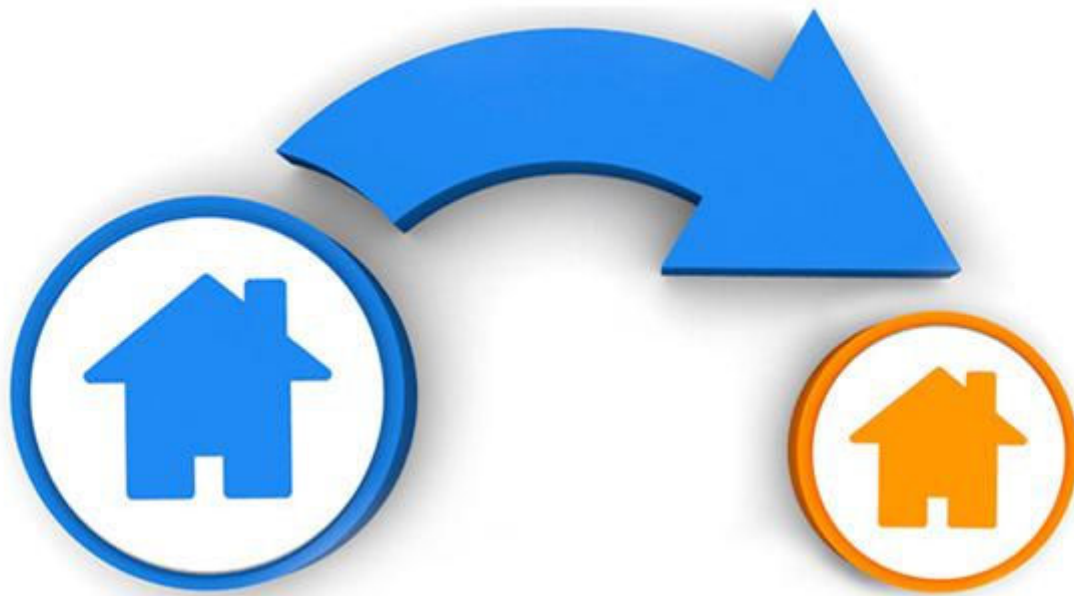
-
- Dewulf, G., Den Heijer, A., De Puy, L., & Van der Schaaf, P. (1999). *Het managen van vastgoed binnen een publieke organisatie*. Delft: Delftse Universitaire Pers.
- Dewulf, G., Krumm, P., & de Jonge, H. (2000). *Successful corporate real estate strategies* (1st ed.). Nieuwegein: Arko Publishers.
- Duivis, R. (2013a). Inzicht in maatschappelijk vastgoed ontbreekt volledig, (384), 14–15.
- Eindhoven | Gemeentelijke organisatie. (2014, March 1). [webpagina]. Retrieved October 19, 2015, from <http://www.eindhoven.nl/artikelen/Gemeentelijke-organisatie.htm>
- Eindhoven | Monumenten. (2015, September 9). [webpagina]. Retrieved October 19, 2015, from <http://www.eindhoven.nl/inwonersplein/bouwen-wonen/monumenten.htm>
- Eindhoven - Onherroepelijke bestemmingsplannen. (n.d.). Retrieved October 12, 2015, from <http://www.eindhoven.nl/artikelen/Onherroepelijke-bestemmingsplannen-1.htm>
- Evers, F., Van der Schaaf, P., & Dewulf, G. (2002). Public real estate: successful management strategies. *Delft University Press Science*.
- Gangwar, R., & Raghuram, G. (2015). Framework for structuring public private partnerships in railways. *Case Studies on Transport Policy*, 3(3), 295–303. <http://doi.org/10.1016/j.cstp.2014.08.005>
- Genesove, D., & Mayer, C. (1994). Equity and time to sale in the real market.
- Gross, M., & Żróbek, R. (2015). Good governance in some public real estate management systems. *Land Use Policy*, 49, 352–364. <http://doi.org/10.1016/j.landusepol.2015.08.017>
- Grzybowski, A. Z. (2015). New results on inconsistency indices and their relationship with the quality of priority vector estimation. *Expert Systems with Applications*. <http://doi.org/10.1016/j.eswa.2015.08.049>
- Hudson-Wilson, S., Gordon, J. N., Fabozzi, F. J., Anson, M. J., & Giliberto, S. M. (2005). Why real estate? *The Journal of Portfolio Management*, 31(5), 12–21.
- Jager, J., & Naus, M. (2012, January). Inwoner Enschede bezit meeste maatschappelijk vastgoed, (1), 3.
- Keuning, D. (2007). *Organisatiestructuur, ontwerpen en herontwerpen* (1st ed.). Noordhoff uitgevers.
- Korsten, A. F. A., Ter Braak, H. J. M., & Van 't Spijker, W. J. H. (1993). Strategisch beleid en management bij de overheid., 8–22.
- Kuijten, M. (2010, December). *Het professionaliseren van gemeentelijk vastgoed*. Amsterdam school of real estate, Amsterdam.
- Lindholm, A., & Leväinen, K. I. (2006). A framework for identifying and measuring value added by corporate real estate. *Journal of Corporate Real Estate*, 8(1), 38–46. <http://doi.org/10.1108/14630010610664796>
- Loozen, J.-P., & Zijlstra, R.-S. (2011). *Municipal real estate, comparing public real estate management in European cities* (Research report) (p. 100). Rotterdam: Deloitte Real Estate Advisory.
- Maatschappelijk vastgoed | Bouwstenen voor Sociaal. (2015, May). Retrieved May 27, 2015, from <http://www.bouwstenen.nl/?q=maatschappelijkvastgoed>
- Mawuntu, S. F. J. (2014). Measuring service quality using analytical hierarchy process (AHP) in the life insurance industry in Manado. *Jurnal Riset Ekonomi, Manajemen, Bisnis Dan Akuntansi*, 2(4). Retrieved from <http://ejournal.unsrat.ac.id/index.php/emba/article/view/6264>

- Musa, M. F. B., & Baharum, Z. A. a. (2012). Corporate Real Estate (CRE): Public Institution of Higher Learning in Malaysia. *Procedia - Social and Behavioral Sciences*, 36, 273–279. <http://doi.org/10.1016/j.sbspro.2012.03.030>
- Nieuwsuur. (2013a). Hilversum: NOS. Retrieved from http://www.npo.nl/nieuwsuur/17-06-2013/NPS_1220661
- Nog 5 kandidaten voor TD-gebouw Eindhoven. (2015, September 29). *Eindhovens Dagblad (web)*. Eindhoven. Retrieved from <http://www.ed.nl/regio/eindhoven/nog-5-kandidaten-voor-td-gebouw-eindhoven-1.5288073.1445877844>
- Nourse, H., & Roulac, S. (1993). linking real estate decisions to corporate strategy. *The Journal of Real Estate Research*, 8(4), 475–494.
- PEARL Light. (2015). Retrieved October 7, 2015, from <http://regionalebevolkingsprognose.kiwi.qdelft.nl/default.aspx>
- Porter's Value Chain • BusinessSetFree.com. (n.d.). Retrieved June 25, 2015, from <http://www.businesssetfree.com/porters-value-chain/>
- Prins, R., & Veuger, J. (2012, November). Vastgoedvisie gemeente zuidhorn. Gemeente Zuidhorn. Retrieved from <http://www.zuidhorn.nl/web/file?uuid=290ca6c9-5e12-4a4d-988b-0ee81464662a&owner=707d06a5-acef-4ebc-898b-eddcf597f7fc&contentid=7170>
- Rijksvastgoedbedrijf, Onze speerpunten. (2015). Retrieved May 28, 2015, from <http://www.rijksvastgoedbedrijf.nl/over-ons/speerpunten>
- Rijksvastgoedbedrijf Verkoopmethodes. (2015). Retrieved June 26, 2015, from <https://www.biedboek.nl/page/process>
- Saaty, T. L. (1980). The analytical hierarchy process: Planning, priority setting, resources allocation.
- Saaty, T. L. (1990). How to make a decision: The analytic Hierarchy Process. *European Journal of Operational Research*, 9(26), 18.
- Saaty, T. L. (1998). Ranking by Eigenvector Versus Other Methods in the Analytical Hierarchy Process. *Elsevier Science*, 11(4), 121–125.
- Saaty, T. L., & González, L. (1991). Prediction, projection and forecasting: applications of the analytic hierarchy process in economics, finance, politics, games and sports.
- Saaty, T. L., & Vargas, L. G. (2006). *Decision making with the analytic network process*. Springer Science+ Business Media.
- Scheffer, J. J. L., Singer, B. P., & Van Meerwijk, M. C. C. (2006). Enhancing the contribution of corporate real estate to corporate strategy. *Journal of Corporate Real Estate*, 8(4), 188–197. <http://doi.org/10.1108/14630010610714862>
- Sieverink, A. (2014). *Incourant vastgoed te koop; een onderzoek naar de optimale verkoopstrategie voor incurant vastgoed*. Amsterdam: Amsterdam school of Real Estate.
- Taken van een gemeente | Gemeenten | Rijksoverheid.nl. (n.d.). Retrieved March 20, 2015, from <http://www.rijksoverheid.nl/onderwerpen/gemeenten/taken-gemeente>
- Teuben, B. (2011). De (on)zin van gemeentelijk vastgoedbezit. *Real Estate Magazine*, (78), 36–41.
- ThesisTools - Student&Onderzoek, maak & verspreid gratis de online enquête voor je scriptie - Enquête, Vragenlijst, Onderzoek. (n.d.). Retrieved October 15, 2015, from <http://www.thesisools.com/>
- Tipping, M., & Bullard, R. K. (2007). Sale-and-leaseback as a British real estate model. *Journal of Corporate Real Estate*, 9(4), 205–217.

-
- van Bentum, J. (2014, September 29). Gemeente kan bezuinigen op vastgoed. *Vastgoedmarkt*. Retrieved from <http://www.vastgoedmarkt.nl/nieuws/2014/09/11/magazine/gemeenten-kunnen-fors-bezuinigen-op-vastgoed>
- van den Bergh, W. F. (2011, March). *Gemeentelijk strategisch vastgoedmanagement*. Amsterdam school of real estate, Amsterdam. Retrieved from <http://www.vastgoedkennis.nl/docs/msre/11/Bergh.pdf>
- van der Geert, P. L. J. . (2006). *Marktwaarde incourant vastgoed; wie het weet mag het zeggen*. Amsterdam school of Real Estate. Retrieved from <http://philpapers.org/rec/VANRRR>
- Van der Schaaf, P. (2002). *Public real estate management; Challenges for government*. TU Delft, Delft University of Technology, Delft.
- Van der Voordt, J. M., & Van der Zwart, J. (2011). value based design and research of hospital buildings. Presented at the MSIBE Conference.
- van der Wal, R., & de Moel, I. (2011). *cijfers maatschappelijk vastgoed 2011.pdf*. Amersfoort. Retrieved from <http://www.bouwstenenvoorsociaal.nl/fileswijkplaats/cijfersmaatschappelijkvastgoed.pdf>
- Van der Zwart, J. (2011). Real estate added value and decision-making in hospital infrastructure. In *Proceedings of the 4th Annual HaCIRIC International Conference“ Global health infrastructure–challenges for the next decade: Delivering innovation, demonstrating the benefits”, Manchester, UK, 26-28 September 2011*. Health and Care Infrastructure Research and Innovation Centre. Retrieved from <http://repository.tudelft.nl/view/ir/uuid:c4219c0e-8b5d-4c10-90cb-82a1a8d10f41/>
- van Dijk, W. G. . (2007). *Visie op dispositie. Een model ter ondersteuning van het afstoten van leeg achterblijvende kantoorgebouwen in kleine kernen*. Eindhoven.
- Van Leent, M. (2007). *maatschappelijk vastgoed als katalysator* (p. 22). Hilversum: Aedes.
- Verspui, P. (2014). *Vastgoed 5 jaar katalysator voor ontwikkeling van Rotterdam* (p. 30). Rotterdam: Gemeente Rotterdam.
- wetten.nl - Wet- en regelgeving - Wet openbaarheid van bestuur - BWBR0005252. (n.d.). Retrieved October 15, 2015, from http://wetten.overheid.nl/BWBR0005252/geldigheidsdatum_15-10-2015
- What is social value? Business Dictionary. (2015). Retrieved October 15, 2015, from <http://www.businessdictionary.com/definition/social-value.html>
- Willems, M. (2013, May 21). Nota gemeentelijk vastgoed; gemeente Beuningen.
- Zoek uw energielabel. (n.d.). Retrieved October 12, 2015, from <http://www.zoekuwenergielabel.nl/energielabel-checker/>
- Zwart, J. van der. (2014). *Building for a better hospital: value-adding management & design of healthcare real estate*. Technische Hogeschool Delft, Faculty of Architecture and the Built Environment, Department of Real Estate & Housing.

Appendix; Downsizing the municipal real estate portfolio

A multi criteria decision support system for defining the added value of public real estate for a municipal organization and applying the right selling method



Master thesis

Author: *Niels Ahsmann*

Student number: *0654249*

Date of final presentation: *24-11-2015*

Graduation program: *Construction management and Engineering*

Graduation committee:

Prof. Dr. Ir. B de Vries

TU Eindhoven

Chairman graduation committee

Dr. Han Qi

TU Eindhoven

1st supervisor

Dr. J.J.A.M Smeets

TU Eindhoven

2nd supervisor

Msc. M. van Kats – Schouwerwou

Brink Groep

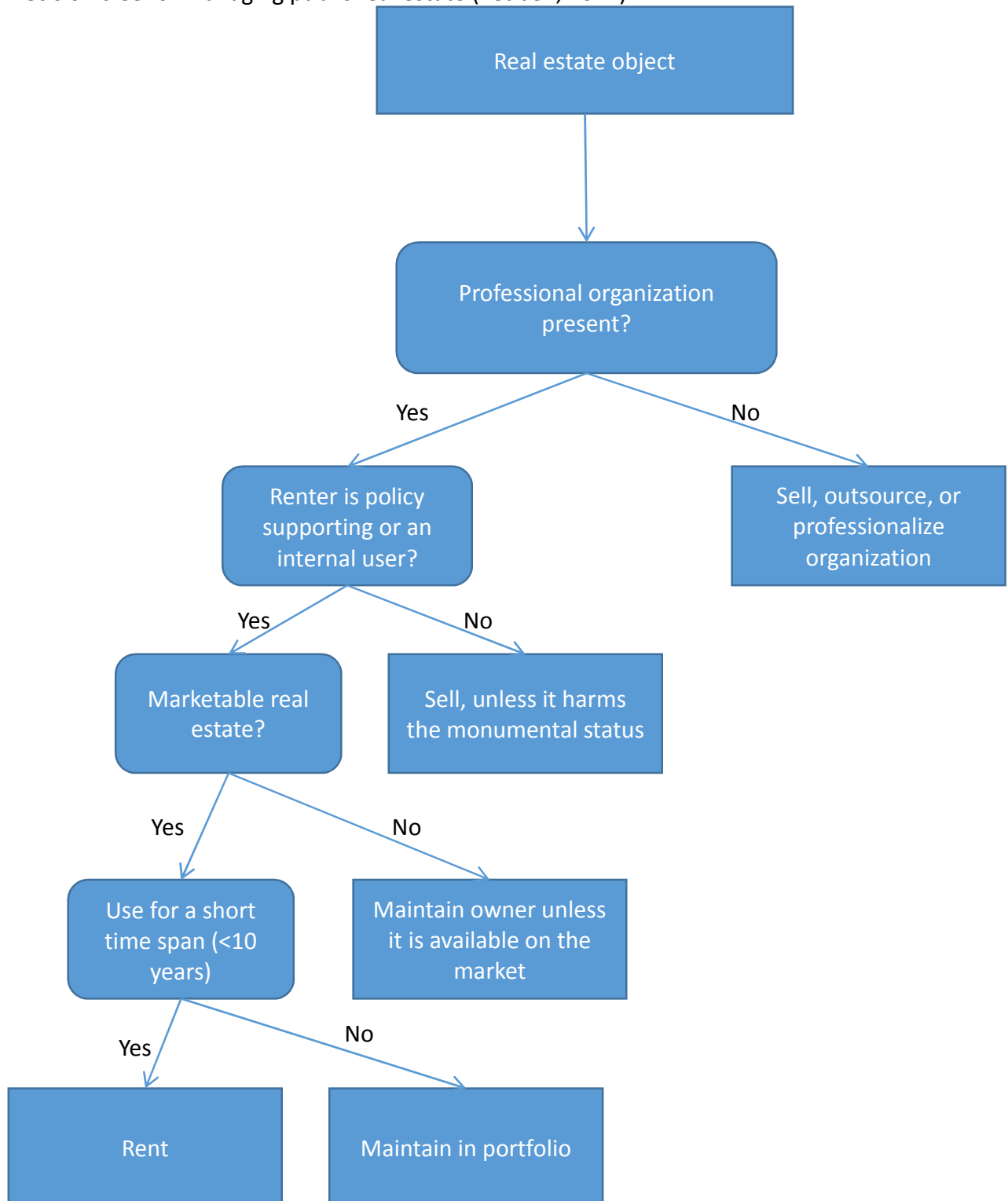
3rd supervisor

Content

Content.....	3
1. Decision tree whether to sell public real estate	5
2. Questionnaire.....	7
3. Consistency rates per set of comparisons	15
4. Consistent sets per consistency rate.....	17
5. Geometrical means per criteria per influencing factor.....	19
6. Weights per criteria per influencing factor.....	25
7. Eindhoven AHP Analysis.....	31
8. Measurable terms in measuring the added value	33
9. Case study information and output	37
9.1. Available data on real estate objects	37
9.2. Scores of the alternatives	49

1. Decision tree whether to sell public real estate

Decision tree for managing public real estate (Teuben, 2011)



2. Questionnaire

Gemeentelijke vastgoed portefeuille

Beste,

Hartelijk dank dat u deze enquête wilt invullen. U helpt mij hiermee met mijn afstudeeronderzoek van de TU Eindhoven in samenwerking met Brink Management & Advies. Voor de afronding van mijn studie Bouwkunde doe ik onderzoek naar de verschillende criteria die meespelen in het beoordelen van het vastgoed in de vastgoedportefeuille van een gemeente.

Het invullen van de enquête duurt ongeveer 15 minuten. De enquête is opgebouwd uit twee onderdelen: een eerste deel met een aantal algemene vragen en vervolgens een inhoudelijk deel waarmee ik mijn onderzoeksvraag wil beantwoorden (Welke criteria bepalen de toegevoegde waarde van een vastgoedobject voor de vastgoedportefeuille van een gemeentelijke organisatie met haar eigen specifieke kenmerken?). Dit deel bestaat uit drie pagina's met vragen over drie verschillende categorieën vastgoed.

Als u op de hoogte wilt blijven van de resultaten dan kunt u aan het einde uw e-mailadres achter laten zodat ik u mijn afstudeerscriptie toe kan sturen.

Start

www.thesistools.com

Gemeentelijke vastgoed portefeuille

Algemene vragen

Hieronder vindt u een aantal algemene vragen over onder andere de basis karakteristieken van uw gemeente en enkele vragen omtrent de organisatiestructuur van uw gemeente. Vanaf de volgende pagina begint het inhoudelijke gedeelte van de enquête.

1.

Voor welke gemeente bent u werkzaam?*

2.

Welke partijen vormen een coalitie in uw gemeente?*

3.

Welke positie heeft de vastgoed afdeling binnen de organisatie van uw gemeente?*

- ☐ Losstaand vastgoedbedrijf (vb. Rijksvastgoedbedrijf)
- ☐ Gecentraliseerde vastgoedafdeling
- ☐ Gedecentraliseerde vastgoedafdeling
- ☐ Anders namelijk:

4.

Vastgoed gerelateerde beslissingen worden op verschillende niveaus gemaakt. Dit kan zeer centraal zijn, bij één persoon of één afdeling, of juist sterk decentraal, elke gemeentelijke afdeling maakt haar eigen vastgoed gerelateerde beslissingen. Ook de mate van concentratie van de werkzaamheden gerelateerd aan het vastgoed kunnen sterk centraal georganiseerd zijn of juist sterk decentraal georganiseerd. Hoe zou u deze twee dimensies binnen uw gemeente typeren?

	Centraal (bij één persoon/afdeling)		Decentraal (bij meerdere personen/afdelingen)
Beslissingsniveau omtrent vastgoed keuzes	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Concentratie van de vastgoed werkzaamheden	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

5.

Zou u hieronder uw functie binnen de gemeente kunnen geven met een korte omschrijving van de taken behorende bij deze functie?

6.

Het Rijksvastgoedbedrijf hanteert vijf verkoopmethodes bij de verkoop van vastgoedobjecten. Welke van de onderstaande vijf verkoopmethodes heeft uw gemeente ervaring mee/weleens toegepast?

- ☐ Standaard verkoopmethode via de makelaar
- ☐ Openbare verkoop met een onvoorwaardelijke bieding
- ☐ Openbare verkoop met een onvoorwaardelijk en voorwaardelijke bieding
- ☐ Openbare verkoop met eenvoudige voorselectie
- ☐ Openbare verkoop met onvoorwaardelijke bieding en een uitgebreide voorselectie

Volgende pagina (3/10)

www.thesisools.com

Uitleg inhoudelijk deel van de enquête

Deze enquête bestaat uitsluitend uit gepaarde vergelijkingen. Dit houdt in dat u telkens moet kiezen tussen twee opties en daarbij tevens aan moet geven hoeveel meer belang u hecht aan de gekozen optie. Ik wil u vriendelijk verzoeken de onderstaande instructies zorgvuldig door te lezen om tot een bruikbaar resultaat te komen.

De aangegeven waardes hebben de volgende betekenis:

- 1 = Even belangrijk
- 3 = Matige belangrijkheid van het een t.o.v. het ander
- 5 = Sterke belangrijkheid van het een t.o.v. het ander
- 7 = Zeer sterke belangrijkheid van het een t.o.v. het ander
- 9 = Extreme belangrijkheid van het een t.o.v. het ander

Alle stellingen worden met elkaar vergeleken. Het is belangrijk dat u hierin consistent bent, zie hieronder een voorbeeld: Stel u wilt een auto kopen, dan kunt letten op de uitstraling, de aanschafkosten en de veiligheid van de auto.

Veiligheid vindt u belangrijker dan de aanschafkosten
Aanschafkosten vindt u belangrijker dan de uitstraling
Veiligheid vindt u belangrijker dan de uitstraling (wanneer Uitstraling belangrijker zou zijn dan veiligheid dan is het antwoord inconsistent)

Hieronder ziet u een afbeelding waarin het bovenstaande voorbeeld is geïllustreerd.

Het invullen van een van de linkerwaardes betekent dat u het eerste criteria belangrijker vindt.
Het invullen van een van de rechterwaardes betekent dat u het tweede criteria belangrijker vindt.

Welk criteria vindt u belangrijker bij het aanschaffen van een auto

	9	7	5	3	1	3	5	7	9
Veiligheid vs. aanschafkosten	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input checked="" type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Aanschafkosten vs. uitstraling	<input type="radio"/>	<input type="radio"/>	<input checked="" type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Veiligheid vs. uitstraling	<input type="radio"/>	<input checked="" type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

Volgende pagina (4/10)

www.thesistools.com

Wat is maatschappelijk vastgoed?

'Maatschappelijk vastgoed is vastgoed dat als doel op zich kan worden gezien en niet als middel om rendement mee te behalen' (De Jonge, 2010).

In de praktijk is maatschappelijk vastgoed een verzamelnaam voor een vastgoed object met een publieke functie op het gebied van:

- Onderwijs (Scholen)
- Sport (Sportthal, sportaccommodaties)
- Cultuur (Musea, bibliotheken)
- Welzijn (Buurthuizen, kerk)
- Maatschappelijke opvang (Daklozen opvangcentra)
- En/of (medische) zorg (Huisartsenpost)

Het is de bedoeling dat u bij de vragen op de komende pagina dit type vastgoed (maatschappelijk vastgoed) in uw achterhoofd houdt bij het invullen van de vragen.

Volgende pagina (5/10)

www.thesistools.com

De toegevoegde waarde van maatschappelijk vastgoed

7.

Welk perspectief vindt u belangrijker met betrekking tot maatschappelijk vastgoed?

Doorgaans worden vastgoedbeslissingen gemaakt vanuit drie verschillende perspectieven, te verstaan: gebruikersperspectief, strategisch perspectief en financieel perspectief. Bij elke beslissing zal er een afweging gemaakt moeten worden tussen deze drie belangen.

Bij gebruikersperspectief wordt geredeneerd vanuit de gebruiker. Hoe ervaart deze gebruiker het vastgoedobject en wat zijn zijn/haar wensen.

Bij een strategisch perspectief wordt geredeneerd vanuit bestuurlijk niveau, hoe past de beslissing in het beleid van de gemeente en de aanwezige structuurvisie. Dit zijn vaak beslissingen die worden gemaakt aan de hand van lange termijn plannen, waarvan de gevolgen dan ook pas op de lange termijn merkbaar zijn.

Tot slot het financieel perspectief, hier wordt voornamelijk gekeken naar de financiële mogelijkheden en de exploitatiekosten van het vastgoedobject.

	9	7	5	3	1	3	5	7	9
Gebruikersperspectief vs. Strategisch perspectief	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Gebruikersperspectief vs. Financieel perspectief	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Strategisch perspectief vs. Financieel perspectief	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

8.

Welke waarden binnen het gebruikersperspectief vindt u belangrijker met betrekking tot maatschappelijk vastgoed?

Productiviteit: Het verbeteren van de productiviteit van het vastgoed houdt in dat het vastgoed zo optimaal mogelijk wordt benut en dat de activiteiten die er plaats vinden zo goed mogelijk worden uitgevoerd.

Gebruikerstevredenheid: Het creëren van een functionele, aangename en comfortabele omgeving voor bezoekers, gebruikers en werknemers. Dit betreft het vastgoed, de omgeving van het vastgoed en de bereikbaarheid van het vastgoed.

Cultuur: Het creëren van een faciliteit waar interactie plaatsvindt en een cultuur wordt ontwikkeld waar mensen zich tot aangetrokken voelen, zowel de cultuur als het vastgoed.

	9	7	5	3	1	3	5	7	9
Productiviteit vs Gebruikerstevredenheid	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Productiviteit vs Cultuur	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Gebruikerstevredenheid vs Cultuur	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

9.

Welke waarden binnen het strategisch perspectief vindt u belangrijker met betrekking tot maatschappelijk vastgoed?

Flexibiliteit: Flexibiliteit vanuit strategisch oogpunt houdt in dat de vastgoedportefeuille zo is ingericht dat er op een adequate en snelle manier gereageerd kan worden op toekomstige ruimtelijke, technische, organisatorische en juridische veranderingen.

Imago: Het representeren van de gemeentelijke doelstellingen door het gebruik maken van vastgoed als een icoon voor de organisatiecultuur.

Innovatie: Het verbeteren en vernieuwen van de diensten die de gemeente aanbiedt aan haar gemeenschap door middel van de aanwezigheid en toegankelijkheid van het vastgoed. (onderwijs, welzijn, sport, stadskantoor etc.)

	9	7	5	3	1	3	5	7	9
Flexibiliteit vs Imago	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Flexibiliteit vs Innovatie	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Imago vs Innovatie	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

10.

Welke waarden binnen het financieel perspectief vindt u belangrijker met betrekking tot maatschappelijk vastgoed?

Kostenreductie: Het reduceren van investeringskosten, financieringskosten, exploitatiekosten en andere vastgoed gerelateerde kosten.

Risico controle: Het anticiperen op toekomstige vastgoed gerelateerde technische en financiële kansen en bedreigingen.

Financiële positie: Het verbeteren van de financiële situatie in de boekhouding en op de balans.

	9	7	5	3	1	3	5	7	9
Kostenreductie vs Risico controle	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Kostenreductie vs Financiële positie	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Risico controle vs Financiële positie	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

Volgende pagina (6/10)

www.thesistools.com

Eigen huisvesting

Het vastgoed dat in de categorie 'Eigen huisvesting' valt is het vastgoed dat wordt gebruikt door de gemeentelijke diensten. Hieronder kan het gemeentehuis/stadskantoor worden verstaan en onder andere kantoren die worden gebruikt door de gemeentelijke diensten.

Het is de bedoeling dat u bij de vragen op de komende pagina dit type vastgoed (vastgoed ten behoeve van de eigen huisvesting) in uw achterhoofd houdt bij het invullen van de vragen.

Volgende pagina (7/10)

www.thesistools.com

De toegevoegde waarde van vastgoed voor de eigen huisvesting

11.

Welk perspectief vindt u belangrijker met betrekking tot de eigen huisvesting?

Doorgaans worden vastgoedbeslissingen gemaakt vanuit drie verschillende perspectieven, te verstaan: gebruikersperspectief, strategisch perspectief en financieel perspectief. Bij elke beslissing zal er een afweging gemaakt moeten worden tussen deze drie belangen.

Bij gebruikersperspectief wordt geredeneerd vanuit de gebruiker. Hoe ervaart deze gebruiker het vastgoedobject en wat zijn zijn/haar wensen.

Bij een strategisch perspectief wordt geredeneerd vanuit bestuurlijk niveau, hoe past de beslissing in het beleid van de gemeente en de aanwezige structuurvisie. Dit zijn vaak beslissingen die worden gemaakt aan de hand van lange termijn plannen, waarvan de gevolgen dan ook pas op de lange termijn merkbaar zijn.

Tot slot het financieel perspectief, hier wordt voornamelijk gekeken naar de financiële mogelijkheden en de exploitatiekosten van het vastgoedobject.

	9	7	5	3	1	3	5	7	9
Gebruikersperspectief vs. Strategisch perspectief	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Gebruikersperspectief vs. Financieel perspectief	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Strategisch perspectief vs. Financieel perspectief	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

12.

Welke waarden binnen het gebruikersperspectief vindt u belangrijker met betrekking tot de eigen huisvesting vastgoed?

Productiviteit: Het verbeteren van de productiviteit van het vastgoed houdt in dat het vastgoed zo optimaal mogelijk wordt benut en dat de activiteiten die er plaats vinden zo goed mogelijk worden uitgevoerd.

Gebruikerstevredenheid: Het creëren van een functionele, aangename en comfortabele omgeving voor bezoekers, gebruikers en werknemers. Dit betreft het vastgoed, de omgeving van het vastgoed en de bereikbaarheid van het vastgoed.

Cultuur: Het creëren van een faciliteit waar interactie plaatsvindt en een cultuur wordt ontwikkeld waar mensen zich tot aangetrokken voelen, zowel de cultuur als het vastgoed.

	9	7	5	3	1	3	5	7	9
Productiviteit vs. Gebruikerstevredenheid	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Productiviteit vs. Cultuur	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Gebruikerstevredenheid vs. Cultuur	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

13.

Welke waarden binnen het strategisch perspectief vindt u belangrijker met betrekking tot de eigen huisvesting?

Flexibiliteit: Flexibiliteit vanuit strategisch oogpunt houdt in dat de vastgoedportefeuille zo is ingericht dat er op een adequate en snelle manier gereageerd kan worden op toekomstige ruimtelijke, technische, organisatorische en juridische veranderingen.

Imago: Het representeren van de gemeentelijke doelstellingen door het gebruik maken van vastgoed als een icoon voor de organisatiecultuur.

Innovatie: Het verbeteren en vernieuwen van de diensten die de gemeente aanbiedt aan haar gemeenschap door middel van de aanwezigheid en toegankelijkheid van het vastgoed. (onderwijs, welzijn, sport, stadskantoor etc.)

	9	7	5	3	1	3	5	7	9
Flexibiliteit vs. Imago	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Flexibiliteit vs. Innovatie	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Imago vs. Innovatie	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

14.

Welke waarden binnen het financieel perspectief vindt u belangrijker met betrekking tot de eigen huisvesting?

Kostenreductie: Het reduceren van investeringskosten, financieringskosten, exploitatiekosten en andere vastgoed gerelateerde kosten.

Risico controle: Het anticiperen op toekomstige vastgoed gerelateerde technische en financiële kansen en bedreigingen.

Financiële positie: Het verbeteren van de financiële situatie in de boekhouding en op de balans.

	9	7	5	3	1	3	5	7	9
Kostenreductie vs. Risico controle	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Kostenreductie vs. Financiële positie	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Risico controle vs. Financiële positie	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

Volgende pagina (8/10)

www.thesistools.com

Commercieel vastgoed in de gemeentelijke vastgoed portefeuille

Veel gemeentes hebben commercieel vastgoed in de vastgoed portefeuille. Dit is vastgoed dat niet voor de eigen huisvesting wordt gebruikt en niet kan worden bestempeld als maatschappelijk vastgoed. Vaak worden hier marktconforme prijzen gehanteerd.

Voorbeelden van commercieel vastgoed in de gemeentelijke vastgoedportefeuille zijn:

- Warenhuis
- Winkel pand in de binnenstad
- Kantoorpand
- Woning

*Vastgoed dat een strategische functie heeft ten behoeve van stedelijke (her)ontwikkeling wordt hier buiten beschouwing gelaten.

Het is de bedoeling dat u bij de vragen op de komende pagina dit type vastgoed (commercieel vastgoed) in uw achterhoofd houdt bij het invullen van de vragen.

Volgende pagina (9/10)

www.thesistools.com

De toegevoegde waarde van commercieel vastgoed

15.

Welk perspectief vindt u belangrijker met betrekking tot het commerciële vastgoed in de gemeentelijke vastgoed portefeuille?

Doorgaans worden vastgoedbeslissingen gemaakt vanuit drie verschillende perspectieven, te verstaan: gebruikersperspectief, strategisch perspectief en financieel perspectief. Bij elke beslissing zal er een afweging gemaakt moeten worden tussen deze drie belangen.

Bij gebruikersperspectief wordt geredeneerd vanuit de gebruiker. Hoe ervaart deze gebruiker het vastgoedobject en wat zijn zijn/haar wensen.

Bij een strategisch perspectief wordt geredeneerd vanuit bestuurlijk niveau, hoe past de beslissing in het beleid van de gemeente en de aanwezige structuurvisie. Dit zijn vaak beslissingen die worden gemaakt aan de hand van lange termijn plannen, waarvan de gevolgen dan ook pas op de lange termijn merkbaar zijn.

Tot slot het financieel perspectief, hier wordt voornamelijk gekeken naar de financiële mogelijkheden en de exploitatiekosten van het vastgoedobject.

	9	7	5	3	1	3	5	7	9
Gebruikersperspectief vs. Strategisch perspectief	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Gebruikersperspectief vs. Financieel perspectief	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Strategisch perspectief vs. Financieel perspectief	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

16.

Welke waardes binnen het gebruikersperspectief vindt u belangrijker met betrekking tot het commerciële vastgoed in de gemeentelijke vastgoed portefeuille?

Productiviteit: Het verbeteren van de productiviteit van het vastgoed houdt in dat het vastgoed zo optimaal mogelijk wordt benut en dat de activiteiten die er plaats vinden zo goed mogelijk worden uitgevoerd.

Gebruikerstevredenheid: Het creëren van een functionele, aangename en comfortabele omgeving voor bezoekers, gebruikers en werknemers. Dit betreft het vastgoed, de omgeving van het vastgoed en de bereikbaarheid van het vastgoed.

Cultuur: Het creëren van een faciliteit waar interactie plaatsvindt en een cultuur wordt ontwikkeld waar mensen zich tot aangetrokken voelen, zowel de cultuur als het vastgoed.

	9	7	5	3	1	3	5	7	9
Productiviteit vs. Gebruikerstevredenheid	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Productiviteit vs. Cultuur	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Gebruikerstevredenheid vs. Cultuur	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

17.

Welke waardes binnen het strategisch perspectief vindt u belangrijker met betrekking tot het commerciële vastgoed in de gemeentelijke vastgoed portefeuille?

Flexibiliteit: Flexibiliteit vanuit strategisch oogpunt houdt in dat de vastgoedportefeuille zo is ingericht dat er op een adequate en snelle manier gereageerd kan worden op toekomstige ruimtelijke, technische, organisatorische en juridische veranderingen.

Imago: Het representeren van de gemeentelijke doelstellingen door het gebruik maken van vastgoed als een icoon voor de organisatiecultuur.

Innovatie: Het verbeteren en vernieuwen van de diensten die de gemeente aanbiedt aan haar gemeenschap door middel van de aanwezigheid en toegankelijkheid van het vastgoed. (onderwijs, welzijn, sport, stads Kantoor etc.)

	9	7	5	3	1	3	5	7	9
Flexibiliteit vs. Imago	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Flexibiliteit vs. Innovatie	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Imago vs. Innovatie	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

18.

Welke waardes binnen het financieel perspectief vindt u belangrijker met betrekking tot het commerciële vastgoed in de gemeentelijke vastgoed portefeuille?

	9	7	5	3	1	3	5	7	9
Kostenreductie vs Risico controle	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Kostenreductie vs Financiële positie	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Risico controle vs Financiële positie	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

Volgende pagina (10/10)

www.thesistools.com

19.

Heeft u nog vragen/opmerkingen naar aanleiding van deze enquête dan is hieronder de ruimte deze op te schrijven.

20.

Wilt u op de hoogte blijven van de resultaten van dit onderzoek dan kunt u hieronder uw e-mailadres achterlaten.

Einde van de enquête

www.thesistools.com

U wordt vriendelijk bedankt voor uw bijdrage aan dit onderzoek. U kunt het scherm nu afsluiten.

www.thesistools.com

3. Consistency rates per set of comparisons

Gemeente	Social real estate				Own housing real estate				Commercial real estate			
	Persp.	User	Strateg.	Financ.	Persp.	User	Strateg.	Financ.	Persp.	User	Strateg.	Financ.
Aalburg en Woudrichem	0,265	0,26	0,033	0,265	0,265	0,265	0,119	0,265	0,265	0,265	0,265	0,265
Arnhem	0,397	0,119	0,12	0,266	0	0,011	0,389	0,473	0,407	0,122	0,025	0,274
Bergen op Zoom	0,265	0,259	0	0,265	0,211	0,265	0,163	0,265	0,541	0	0,122	0
Best	0	0,025	0,473	0,49	0	0	0	0	0,772	0,12	0,057	0
Bladel	0	0,259	0,117	0,118	0,12	0	0,264	0	0	0,265	0,265	0,265
Brielle	0,389	999	0,011	0	0	999	0,011	0	0	0	0	0
Cuijk	0,006	3,272	0,772	0,033	0,033	0	0,265	0,006	0,011	0,12	0,265	0,121
Delft	0,07	0,265	0,006	0,118	0,121	0,056	0,033	0,033	0,118	0,12	0,264	0,118
Deurne	0,033	0,12	0,118	0	0,118	0,118	0	0,118	0,118	0,118	0,49	0
Elburg	0,206	0,118	0,211	0,206	0,266	0,266	0,119	0	0	0,211	0,265	0
Emmen	0	0,265	0,27	0,011	0,056	0	0,12	0,404	999	999	999	999
Hardenberg	0,118	0	0	0,118	0	0,025	0	0,117	0,264	0,264	0,118	0,118
Heemstede	0,265	999	0,265	0,49	0,6561	0,025	0,07	0,025	0,033	0,025	0,025	0,117
Katwijk	0,404	0,397	0,119	0,118	0,473	0,266	999	0,163	3,272	0,406	0,163	0,473
Meppel	0,27	0,26	0	0,07	0,033	0,26	0,49	0,401	0,406	0	0,025	0,07
Noord-Beveland	0,406	0,391	0,071	0,406	0	0,119	0,006	0,406	0	0	0,006	0
Oirschot	0,49	0	0,26	0,118	0	0	0,118	0	0,119	0	0,025	0
Oss	0,119	0,118	0	0,12	0	0	0,025	0	0,265	0,259	0,259	0,12
Purmerend	0	0	0,025	0	0,541	0,274	0,07	0	0,119	0,26	0,265	0
Roermond	0	0,118	0,117	0	0	0	0	0	0	0	0	0
Rucphen	0,665	0,119	0,117	0,259	0	0,011	0,025	0	0,163	0,118	0,025	0,117
Schiermonnikoog	1,6	0,033	0,26	0,033	0,033	0	0,025	0,26	0,033	0,025	0,118	0,025
s-Gravenhage	0,266	0	0,011	0	0,265	0	0,011	0	0	0,118	0,117	0
Tiel	0,27	0,406	0,882	0,541	0,541	0,407	0,267	0,541	0,274	0,541	0,362	0,189
Veghel	0,265	0,011	0	0	0	0	0,103	0	0,011	1,808	0	0
Waalwijk	0,07	0,033	0	0,57	0,011	0,397	0	0	0	0	0	0
Wierden	0,07	0,259	0	0	0	0,118	0	0	999	0,117	0	0
Woerden	0,406	0	0,011	0	0,12	0	0,302	0	0	0,414	0	0
Woudenberg	0,118	999	0,12	0,118	0,265	0,265	0,473	0,265	0,265	0,265	0,264	0,265

4. Consistent sets per consistency rate

A: Number of consistent sets with a CI of 0,1

Consistency Rate: 0,1	Social real estate	Real estate for own housing	Commercial real estate
Perspectives	10	17	12
Sub criteria in user perspective	10	16	9
Sub criteria in strategic perspective	14	15	13
Sub criteria in financial perspective	13	17	16
Complete sets	1	4	4

B: Number of consistent sets with a CI of 0,15

Consistency Rate: 0,15	Social real estate	Real estate for own housing	Commercial real estate
Perspectives	13	21	16
Sub criteria in user perspective	16	20	18
Sub criteria in strategic perspective	22	21	18
Sub criteria in financial perspective	20	19	23
Complete sets	5	10	8

C: Number of consistent sets with a CI of 0,2

Consistency Rate: 0,2	Social real estate	Real estate for own housing	Commercial real estate
Perspectives	13	21	17
Sub criteria in user perspective	16	20	18
Sub criteria in strategic perspective	22	22	19
Sub criteria in financial perspective	20	20	24
Complete sets	5	10	9

5. Geometrical means per criteria per influencing factor

Social real estate: organization structure

Organization structure	Report											
	A1.A2	A1.A3	A2.A3	B1.B2	B1.B3	B2.B3	C1.C2	C1.C3	C2.C3	D1.D2	D1.D3	D2.D3
Centralized organization	N	6	6	8	8	8	15	15	15	13	13	13
Geometric Mean	1,5010	2,6085	1,3808	1,5576	2,7868	1,7133	5,3335	1,2740	,2641	1,9545	1,6926	,7527
Decentralized organization	N	7	7	7	8	8	7	7	7	7	7	7
Geometric Mean	1,1379	,9270	1,0726	,7328	,7801	2,2795	2,9992	2,2746	,9490	1,1683	1,1666	1,3648
Total	N	13	13	16	16	16	22	22	22	20	20	20
Geometric Mean	1,2930	1,4943	1,2052	1,0684	1,4745	1,9762	4,4408	1,5320	,3967	1,6324	1,4858	,9270

Own housing real estate: organization structure

Organization structure	Report											
	A1.A2	A1.A3	A2.A3	B1.B2	B1.B3	B2.B3	C1.C2	C1.C3	C2.C3	D1.D2	D1.D3	D2.D3
Centralized organization	N	12	12	12	12	12	11	11	11	10	10	10
Geometric Mean	2,0189	1,3698	,6087	,8542	2,7390	2,9210	4,7969	1,6347	,3333	1,8089	1,4618	,8942
Decentralized organization	N	9	9	8	8	8	10	10	10	9	9	9
Geometric Mean	1,6716	,7790	,5466	,6583	1,2331	2,3517	3,5888	1,6315	,5597	1,5231	2,0228	1,2047
Total	N	21	21	20	20	20	21	21	21	19	19	19
Geometric Mean	1,8620	1,0755	,5813	,7697	1,9905	2,6784	4,1779	1,6332	,4266	1,6674	1,7049	1,0298

Commercial real estate: Organization structure

Organization structure	Report											
	A1.A2	A1.A3	A2.A3	B1.B2	B1.B3	B2.B3	C1.C2	C1.C3	C2.C3	D1.D2	D1.D3	D2.D3
Centralized organization	N	9	9	9	9	9	11	11	11	13	13	13
Geometric Mean	,1912	,1738	,8831	2,1409	2,0011	1,1273	2,6326	1,4999	,6741	2,1269	1,4855	,8425
Decentralized organization	N	7	7	9	9	9	7	7	7	10	10	10

Geometrical means per criteria per influencing factor

Geometric Mean		.7285	.6772	.8930	.6176	1,6120	2,1828	2,8585	1,3499	.4941	1,3414	1,2136	.7597
Total	N	16	16	16	18	18	18	18	18	18	23	23	23
Geometric Mean		.3432	.3151	.8874	1,1499	1,7961	1,5687	2,7182	1,4397	.5974	1,7407	1,3605	.8055

Social real estate: Sizes

Size of municipality	Report												
	A1.A2	A1.A3	A2.A3	B1.B2	B1.B3	B2.B3	C1.C2	C1.C3	C2.C3	D1.D2	D1.D3	D2.D3	
<20.000	2	2	2	2	2	2	4	4	4	5	5	5	5
	Geometric Mean	3,0000	1,7321	.4472	.5745	1,7321	5,5444	2,4323	.6671	2,6673	.9960	.6405	
20.000-50.000	5	5	5	6	6	6	7	7	7	5	5	5	5
	Geometric Mean	.7721	.5795	.9407	.9950	2,0801	3,2619	1,8074	.5051	.7233	1,4728	1,9332	
50.000-100.000	5	5	5	5	5	5	8	8	8	7	7	7	7
	Geometric Mean	1,6280	3,9363	1,8384	1,5518	1,7153	5,4249	1,5098	.2619	2,0153	2,0153	.7275	
100.000<	1	1	1	3	3	3	3	3	3	3	3	3	3
	Geometric Mean	1,0000	1,0000	1,3219	4,7177	2,4662	3,9791	.5848	.3420	1,7100	1,4422	.8879	
Total	13	13	13	16	16	16	22	22	22	20	20	20	20
	Geometric Mean	1,2930	1,4943	1,2052	1,0684	1,9762	4,4408	1,5320	.3967	1,6324	1,4858	.9270	

Own housing real estate: Sizes

Size of municipality	Report												
	A1.A2	A1.A3	A2.A3	B1.B2	B1.B3	B2.B3	C1.C2	C1.C3	C2.C3	D1.D2	D1.D3	D2.D3	
<20.000	5	5	5	4	4	4	4	4	4	3	3	3	3
	Geometric Mean	3,2654	2,9482	.5069	1,8841	2,8173	5,5444	1,3161	.2350	2,4662	1,7043	.6910	
20.000-50.000	8	8	8	7	7	7	9	9	9	9	9	9	9
	Geometric Mean	1,1935	.5737	.6202	1,3167	2,5636	4,2938	1,8233	.5615	1,6120	2,0228	1,2047	
50.000-100.000	5	5	5	5	5	5	5	5	5	6	6	6	6

Geometric Mean	2,5314	1,3324	,5243	1,2457	3,3798	3,4997	2,9482	1,9332	,5407	1,5704	1,4422	,9983
N	3	3	3	4	4	4	3	3	3	1	1	1
Geometric Mean	1,4326	,7489	,4041	,9344	2,2361	1,9680	4,7177	1,1817	,2793	1,0000	1,0000	1,0000
N	21	21	21	20	20	20	21	21	21	19	19	19
Geometric Mean	1,8620	1,0755	,5813	,7697	1,9905	2,6784	4,1779	1,6332	,4266	1,6674	1,7049	1,0298

Commercial real estate: Sizes

Size of municipality	Report											
	A1.A2	A1.A3	A2.A3	B1.B2	B1.B3	B2.B3	C1.C2	C1.C3	C2.C3	D1.D2	D1.D3	D2.D3
<20.000	5	5	5	4	4	4	4	4	4	4	4	4
Geometric Mean	,3919	,3538	,6418	1,6266	1,8435	1,0000	4,4860	1,6225	,5745	2,5900	1,3128	,5745
N	6	6	6	8	8	8	7	7	7	10	10	10
Geometric Mean	,4393	,4581	1,2681	,4755	1,2182	2,0951	3,0748	1,4724	,4600	1,4226	1,6471	,9483
50.000-100.000	4	4	4	3	3	3	4	4	4	7	7	7
Geometric Mean	,2514	,1905	,7560	1,7100	1,7100	1,4422	2,8102	2,8102	,7579	1,7226	,9168	,6218
N	1	1	1	3	3	3	3	3	3	2	2	2
Geometric Mean	,1400	,1400	1,0000	5,1299	5,1299	1,4374	1,0000	,4775	,8434	2,2361	2,2361	1,7321
Total	16	16	16	18	18	18	18	18	18	23	23	23
Geometric Mean	,3432	,3151	,8874	1,1499	1,7961	1,5687	2,7182	1,4397	,5974	1,7407	1,3605	,8055

Social real estate: demographic transition

Demographic transition	Report											
	A1.A2	A1.A3	A2.A3	B1.B2	B1.B3	B2.B3	C1.C2	C1.C3	C2.C3	D1.D2	D1.D3	D2.D3
< 0%	2	2	2	3	3	3	2	2	2	2	2	2
Geometric Mean	2,2361	2,2361	1,0000	,7489	1,2806	3,5569	5,1962	1,7321	,4472	2,2361	1,0000	,3742
N	4	4	4	5	5	5	7	7	7	6	6	6
Geometric Mean	,4080	,9950	1,9680	2,3714	3,1598	1,9332	5,4221	1,5449	,2499	1,1989	1,1989	,9967
3.4% < N	7	7	7	8	8	8	13	13	13	12	12	12

Geometrical means per criteria per influencing factor

Geometric Mean	2,1373	1,6802	,9606	,7416	,9654	1,6073	3,8930	1,4966	,4996	1,8074	1,7670	1,0400
Total	N	13	13	16	16	16	22	22	22	20	20	20
Geometric Mean	1,2930	1,4943	1,2052	1,0684	1,4745	1,9762	4,4408	1,5320	,3967	1,6324	1,4858	,9270

Own housing real estate: demographic transition

	Report											
	A1.A2	A1.A3	A2.A3	B1.B2	B1.B3	B2.B3	C1.C2	C1.C3	C2.C3	D1.D2	D1.D3	D2.D3
< 0%	2	2	2	2	2	2	4	4	4	3	3	3
Geometric Mean	4,5826	3,0000	,4472	,3742	1,0000	2,2361	6,2997	1,9631	,2836	,9967	1,4422	1,4422
0 - 3.4%	7	7	7	8	8	8	8	8	8	7	7	7
Geometric Mean	1,7176	,9957	,6782	,9370	2,8138	3,4451	4,0784	2,5900	,5561	1,7201	1,6013	,9986
3.4% <	12	12	12	10	10	10	9	9	9	9	9	9
Geometric Mean	1,6797	,9482	,5550	,7597	1,7317	2,2703	3,5562	,9989	,4041	1,9320	1,8928	,9427
Total	21	21	21	20	20	20	21	21	21	19	19	19
Geometric Mean	1,8620	1,0755	,5813	,7697	1,9905	2,6784	4,1779	1,6332	,4266	1,6674	1,7049	1,0298

Commercial real estate: demographic transition

	Report											
	A1.A2	A1.A3	A2.A3	B1.B2	B1.B3	B2.B3	C1.C2	C1.C3	C2.C3	D1.D2	D1.D3	D2.D3
< 0%	2	2	2	1	1	1	1	1	1	3	3	3
Geometric Mean	,1905	,3317	3,0000	,3300	1,0000	3,0000	3,0000	5,0000	1,0000	,4775	1,0000	1,4422
0 - 3.4%	6	6	6	7	7	7	8	8	8	9	9	9
Geometric Mean	,2912	,2098	,6899	1,3186	1,6594	1,1699	3,6288	2,2062	,6198	1,7227	1,2751	,9438
3.4% <	8	8	8	10	10	10	9	9	9	11	11	11

Geometric Mean	,4499	,4220	,7905	1,1837	2,2488	1,8052	2,0797	,8578	,5460	2,4979	1,5603	,6036
Total	N	16	16	18	18	18	18	18	18	23	23	23
Geometric Mean	,3432	,3151	,8874	1,1499	1,7961	1,5687	2,7182	1,4397	,5974	1,7407	1,3605	,8055

Geometrical means on sets per type of real estate

Report												
Type Real Estate	A1.A2	A1.A3	A2.A3	B1.B2	B1.B3	B2.B3	C1.C2	C1.C3	C2.C3	D1.D2	D1.D3	D2.D3
Social Real Estate	N	13	13	16	16	16	22	22	22	20	20	20
Geometric Mean	1,2930	1,4943	1,2052	1,0684	1,4745	1,9762	4,4408	1,5320	,3967	1,6324	1,4858	,9270
Own housing Real Estate	N	21	21	20	20	20	21	21	21	19	19	19
Geometric Mean	1,8620	1,0755	,5813	,7697	1,9905	2,6784	4,1779	1,6332	,4266	1,6674	1,7049	1,0298
Commercial Real Estate	N	16	16	18	18	18	18	18	18	23	23	23
Geometric Mean	,3432	,3151	,8874	1,1499	1,7961	1,5687	2,7182	1,4397	,5974	1,7407	1,3605	,8055
Total	N	50	50	54	54	54	61	61	61	62	62	62
Geometric Mean	,9858	,7909	,8045	,9697	1,7598	2,0479	3,7621	1,5377	,4590	1,6826	1,5000	,9087

6. Weights per criteria per influencing factor

Global weights per type of real estate

	Social real estate	Own housing real estate	Commercial real estate
User	39%	38%	17%
Strategic	45%	26%	28%
Financial	17%	36%	55%
Productivity	20%	16%	7%
User satisfaction	12%	16%	6%
Culture	7%	6%	4%
Flexibility	23%	14%	13%
Image	6%	5%	5%
Innovation	16%	7%	10%
Cost reduction	7%	17%	24%
Risk control	5%	10%	12%
Financial position	5%	9%	19%

Local weights per type of real estate

	Social real estate	Own housing real estate	Commercial real estate
Productivity	52%	42%	41%
User satisfaction	30%	41%	34%
Culture	18%	17%	25%
Flexibility	52%	54%	45%
Image	13%	17%	19%
Innovation	35%	28%	36%
Cost reduction	44%	47%	43%
Risk control	27%	28%	22%
Financial position	29%	25%	35%

Weights per criteria per influencing factor

Cost reduction	44%	33%	50%	44%	50%	47%	43%	33%	47%	43%	38%	52%
Risk control	20%	45%	22%	26%	20%	29%	28%	33%	19%	29%	23%	29%
Financial position	37%	23%	28%	30%	30%	24%	29%	33%	34%	28%	39%	20%

Global weights per group of demographic transition

	Social real estate			Own housing real estate			Commercial real estate		
	Shrink	Stagnation	Growth	Shrink	Stagnation	Growth	Shrink	Stagnation	Growth
User	53%	23%	49%	64%	39%	38%	10%	11%	18%
Strategic	24%	52%	24%	12%	24%	22%	64%	37%	37%
Financial	24%	25%	27%	24%	37%	40%	26%	52%	45%
Productivity	16%	13%	14%	14%	16%	13%	2%	5%	8%
User satisfaction	27%	6%	21%	35%	18%	17%	6%	3%	7%
Culture	10%	4%	14%	15%	5%	8%	2%	3%	4%
Flexibility	14%	28%	13%	7%	15%	10%	42%	21%	15%
Image	3%	5%	4%	1%	3%	3%	12%	6%	8%
Innovation	7%	19%	8%	4%	6%	9%	10%	10%	15%
Cost reduction	10%	11%	13%	9%	17%	20%	7%	22%	22%
Risk control	4%	8%	7%	9%	10%	10%	12%	14%	9%
Financial position	10%	6%	7%	6%	10%	11%	7%	16%	14%

Local weights per group of demographic transition

	Social real estate			Own housing real estate			Commercial real estate		
	Shrink	Stagnation	Growth	Shrink	Stagnation	Growth	Shrink	Stagnation	Growth
Productivity	30%	57%	29%	22%	41%	35%	20%	42%	44%
User satisfaction	51%	27%	42%	55%	46%	45%	60%	31%	36%
Culture	19%	16%	28%	23%	14%	20%	20%	26%	20%
Flexibility	58%	54%	53%	60%	61%	45%	66%	58%	39%
Image	12%	10%	15%	9%	14%	15%	19%	16%	20%
Innovation	30%	37%	32%	31%	25%	40%	16%	26%	41%
Cost reduction	40%	43%	47%	37%	45%	49%	25%	43%	49%
Risk control	17%	31%	27%	37%	27%	25%	46%	27%	19%
Financial position	43%	26%	26%	26%	28%	26%	29%	31%	32%

Global weights per group of organization structure

	Social real estate		Own housing real estate		Commercial real estate	
	Centralize d	Decentralize d	Centralize d	Decentralize d	Centralize d	Decentralize d
User	49%	34%	45%	35%	8%	26%
Strategic	30%	36%	21%	22%	43%	35%
Financial	20%	31%	34%	43%	49%	39%
Productivity	25%	9%	18%	10%	4%	8%
User satisfaction	16%	16%	20%	17%	2%	12%
Culture	9%	9%	7%	8%	2%	5%
Flexibility	16%	20%	12%	12%	21%	17%
Image	3%	7%	2%	4%	9%	6%
Innovation	12%	8%	7%	7%	13%	12%
Cost reduction	10%	11%	15%	20%	23%	15%
Risk control	5%	11%	9%	13%	11%	11%
Financial position	6%	9%	10%	10%	14%	13%

Local weights per group of organization structure

	Social real estate		Own housing real estate		Commercial real estate	
	Centralize d	Decentralize d	Centralize d	Decentralize d	Centralize d	Decentralize d
User	49%	34%	45%	35%	8%	26%
Strategic	30%	36%	21%	22%	43%	35%
Financial	20%	31%	34%	43%	49%	39%
Productivity	50%	27%	40%	29%	51%	31%
User satisfaction	32%	47%	45%	48%	25%	48%
Culture	18%	27%	15%	22%	24%	21%
Flexibility	51%	57%	55%	53%	49%	48%
Image	10%	20%	11%	16%	20%	17%
Innovation	39%	23%	34%	31%	31%	35%
Cost reduction	47%	37%	45%	47%	47%	39%
Risk control	23%	35%	26%	30%	24%	27%
Financial position	29%	28%	30%	24%	30%	34%

7. Eindhoven AHP Analysis

Geometrical means per type of real estate

Report												
Type Real Estate	A1.A2	A1.A3	A2.A3	B1.B2	B1.B3	B2.B3	C1.C2	C1.C3	C2.C3	D1.D2	D1.D3	D2.D3
Social Real Estate N	3	3	3	6	6	6	9	9	9	7	7	7
Geometric Mean	,9135	3,9791	2,7589	1,3808	2,1684	1,5678	4,9395	1,0675	,2542	2,0153	2,3577	,9155
Own housing Real Estate N	6	6	6	7	7	7	5	5	5	5	5	5
Geometric Mean	1,5625	,7622	,4853	1,1254	3,2309	3,0793	2,8037	,9980	,4652	1,7188	1,5518	,9980
Commercial Real Estate N	3	3	3	5	5	5	6	6	6	7	7	7
Geometric Mean	,1719	,1719	,6910	3,6801	3,6801	1,5487	2,3956	1,6554	,7634	2,1678	1,1538	,7275
Total N	12	12	12	18	18	18	20	20	20	19	19	19
Geometric Mean	,7869	,7940	,8186	1,6744	2,9329	2,0315	3,4507	1,1973	,4112	1,9853	1,6231	,8605

Weights per criteria per type of real estate

(Sub) criteria	Weights for social estate	Weights for own housing real estate	Weights for commercial real estate
User perspective	44,7%	33,9%	7,9%
Strategic perspective	42,1%	21,6%	38,8%
Financial perspective	13,2%	44,5%	53,3%
Improving productivity	20,5%	15,3%	5,1%
Increasing user satisfaction	14,8%	13,9%	1,6%
Improve culture	9,4%	4,6%	1,2%
Improving flexibility	20%	9,4%	19,3%
Supporting image	4,3%	3,7%	8,3%
Increasing innovation	17,8%	8,6%	11,3%
Reducing costs	6,9%	20,%	23,2%
Controlling risks	3,1%	12%	11,9%
Improving the financial position	3,2%	15,5%	18,1%

8. Measurable terms in measuring the added value

Lindholm, A., & Leväinen, K. I. (2006). A framework for identifying and measuring value added by corporate real estate. *Journal of Corporate Real Estate*, 8(1), 38–46. <http://doi.org/10.1108/14630010610664796>

Reduce cost

- Occupancy cost per square foot/metre
- Occupancy cost per seat
- Occupancy cost per employee
- Occupancy cost per dollar/unit of revenue
- Occupancy cost as a percent of total operating expense
- Occupancy cost as a percent of operating revenue by business unit
- Occupancy cost as a percent of operating revenue by building
- Occupancy cost per unit of production
- Occupancy cost as a percent of total labor and overhead by business unit
- Occupancy cost by building
- Space (square feet or metres) per employee
- Whether workplace standards are used
- Percent of space occupied
- Percent operational space versus non-operational space
- Total owned and leased space (square feet/metres)
- Persons per seat
- Number of moves per year
- Cost of under utilized space
- Real estate cost per CRE employee
- Total CREM operating expenditures versus budget

Increase flexibility

- Percent leased space relative to total space
- Length of lease terms
- Use of virtual and flexible workspaces

Increase productivity

- Employees' opinions on how well the workplace supports their productivity
- Distance employees commute
- Distance among company sites and businesses
- Time wasted with interruptions (due to open space layout)
- Percent shared services
- No loss of business due to real estate service failure
- Real estate spending as percent of gross margin
- Real estate spending as percent of total operating expenses
- Time used on real estate projects versus time budgeted for projects
- Money spent on real estate projects versus money budgeted for projects
- Amount of real estate advice given to other business units
- Number of service providers/service level agreements

-
- Number of transactions/projects/leases per
 - FTE employee
 - CRE employee qualifications
 - Employee turnover
 - Number of steps/time for real estate approval process
 - Use of audits for service providers

Increase employee/internal client satisfaction

- Distance to required transportation modes for employees
- Employee satisfaction with work environment
- Quality of indoor environment (lightning, temperature, noise)
- Workspace (size, shape)
- Amount of nearby amenities for employees
- Range of services offered by CREM
- Employee/internal customer satisfaction with responsiveness of CREM staff
- Employee satisfaction with CREM staff professional skills
- Employee satisfaction with CREM information sharing
- CREM response time to requests
- Competence of CREM staff
- Investment in training per CREM employee

Increase innovations

- Number of teamwork settings
- Number of workstations per employee

Promote marketing and sales

- Distance to required transportation modes for customers
- Distance to customers
- Use of company logos and colors in workplace design
- Image rating based on building attributes
- Energy consumption (conservation)
- Number of energy audits
- Environmental sustainability of buildings

Increase value of assets

- Real estate cost of acquisitions versus returns/IRR
- Lease vs construction or ownership cost comparisons
- Aging reports for leases
- Real estate holding costs per year
- Number of building quality audits
- Real estate return on investment
- Real estate return on equity
- Business return on real estate assets
- Sales or revenue per square foot (metre)

value

- Space (square feet or metres) per unit (dollar)
- of revenue
- Market capital value versus book value
- by building
- Percentage of surplus assets sold
- Time to dispose of properties versus plan
- Cost of disposal of property versus savings
- Time to clear buildings versus plan
- Number of development projects for obsolete properties
- Status of risk management activity (contaminated sites)

Effectiveness in corporate strategic process

- Percent CREM employees indicating strong understanding
- of how their jobs fit into attaining corporate objectives
- CREM involved corporate strategic planning
- CREM integrated with other functional strategies (HR, IT, etc.)
- CREM actively involved in firm-wide initiatives such as special asset use, consolidations, or shared services opportunities
- Number of formal and informal CREM meetings with top executives
- Fulfillment of CREM strategic aims
- CREM communication time with top executives
- Self evaluation of how well CREM decisions support strategy

Scheffer, J. J. L., Singer, B. P., & Van Meerwijk, M. C. C. (2006). Enhancing the contribution of corporate real estate to corporate strategy. *Journal of Corporate Real Estate*, 8(4), 188–197. <http://doi.org/10.1108/14630010610714862>

Increasing productivity

- Selection of location
- Innovative workplaces
- Retaining human capital

Cost reduction

- Workplace costs
- Accommodation costs
- Facility costs
- Benchmarking
- Corporate finance

Risk control

- Inflexibility of real estate portfolio
- Selection of location
- Value risk
- Working environment
- Environmental aspects
- Development process

Increase of value

- Acquisition and disposal of real estate
- Redevelopment of real estate
- Market analysis

Increase of flexibility

- Organisational flexibility
- Financial flexibility
- Technical flexibility

Changing the culture

- Workplace innovation
- Communication

PR and marketing

- Image
- Selling points
- Sales strategy

9. Case study information and output

9.1. Available data on real estate objects

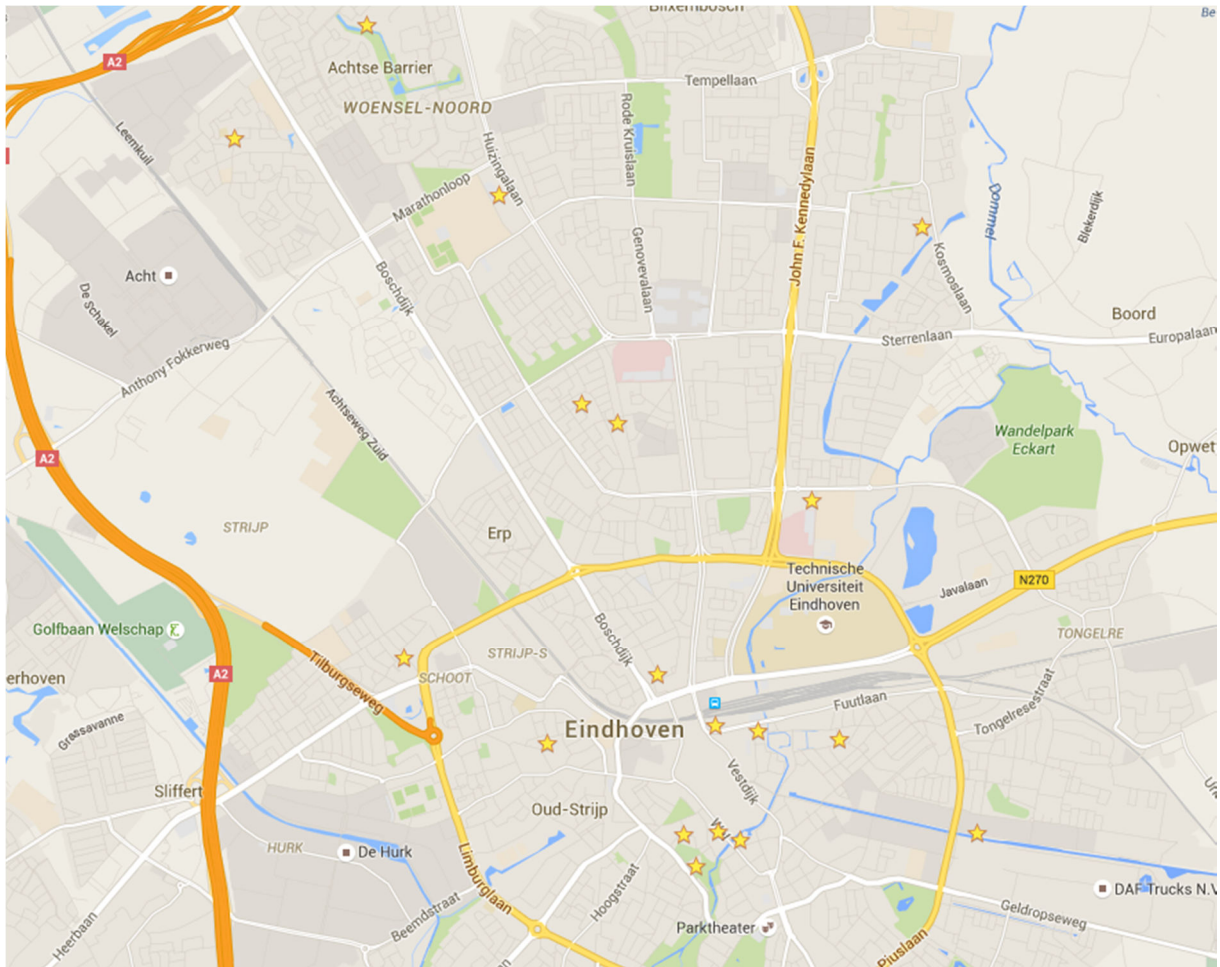


Figure: overview map of selected real estate objects for study case

Address	Net floor space (M2)	Function	year object is built	Monumental status	Energy label
Barrierweg 1	2268	Sports/education	1961	-	-
Reigerlaan 3	3685	Education	1915	National monument	-
Hemelrijken 310	1976	Education	1986	-	-
Don Boscostraat 2	2848	Education/gathering	1930	-	-
Kanaaldijk noord 61	1250	Office/industry	1967	-	-
Savoiepad 14	1900	Sports/gathering	1983	-	D
Vijfkamplaan 12	13039	Sports	1997	-	-
Weegschaalstraat 1	2350	Sports	1971	-	-
Iepenlaan 40	715	Gathering	1987	-	-
Koenraadlaan 98	3595	Gathering	1982	-	-
Lekstraat 4	2922	Gathering	1936	-	-

Van der Werffstraat 14	6506	Gathering	1968	-
Bilderdijklaan 10	9475	Gathering	1934	National monument D
Dommelstraat 2	4087	Gathering	1910	Municipal monument B
Stationsplein 17	1983	Retail	1983	-
Stadhuisplein 10	12232	Office	1999	C
Frederik van Eedenplein 1	11303	Office	1948	-

Barrierweg 1



Reigerlaan 3



Hemelrijken 310



Don Boscostraat 2



Kanaaldijk Noord 61



Savoiepad 14



Vijfkamplaan 12



Weegschaalstraat 1



Iepenlaan 40



Koenraadlaan 98



Lekstraat 4



Van der Werffstraat 14



Bilderdijklaan 10



Dommelstraat 2



Stationsplein 17



Stadhuisplein 10



Frederik van Eedenplein 1



9.2. Scores of the alternatives

Social real estate: primary schools

	Reigerlaan		Barrierweg		Don Bos.		Hemelrijken	
Improving productivity	4	0,82	8	1,64	6	1,23	7	1,435
Increasing user satisfaction	7	1,036	6	0,888	7	1,036	6	0,888
Improve culture	6	0,564	5	0,47	6	0,564	5	0,47
Improving flexibility	3	0,6	8	1,6	4	0,8	4	0,8
Supporting image	8	0,344	6	0,258	7	0,301	5	0,215
Increasing innovation	5	0,89	7	1,246	5	0,89	5	0,89
Reducing costs	4	0,276	7	0,483	5	0,345	8	0,552
Controlling risks	4	0,124	7	0,217	6	0,186	7	0,217
Improving the financial position	7	0,224	5	0,16	6	0,192	6	0,192
	4,878		6,962		5,544		5,659	

The Reigerlaan is not a real estate object specifically designed as school. Comparing the other three schools with each other will lead to a high productivity of the Barrierweg. The user satisfaction is rather high for all of the schools. They have an open and inviting appearance and a comfortable climate. This is the same for the culture.

The Barrierweg has a high score for flexibility, there is much room to expand. The other schools do not have physical flexibility space and the reigerlaan is a monument which makes it hard to make changes. This monumental status gives a high score for supporting image. The only school that allows an innovative work setting is the Barrierweg.

The monumental status gives a high cost for the Reigerlaan but makes it a good asset on the balance sheet as well. Hemelrijken is very efficient in the cost reduction. A maximum use of the space is achieved.

Social real estate: Sports accommodation

	Kanaaldijk		Savoiepad		Vijfkamplaan		Weegschaalstraat	
Improving productivity	5	1,025	6	1,23	8	1,64	7	1,435
Increasing user satisfaction	4	0,592	5	0,74	6	0,888	5	0,74
Improve culture	4	0,376	5	0,47	6	0,564	4	0,376
Improving flexibility	2	0,4	2	0,4	3	0,6	4	0,8
Supporting image	3	0,129	4	0,172	5	0,215	3	0,129
Increasing innovation	4	0,712	6	1,068	7	1,246	6	1,068
Reducing costs	6	0,414	7	0,483	6	0,414	7	0,483
Controlling risks	6	0,186	6	0,186	8	0,248	4	0,124
Improving the financial position	5	0,16	4	0,128	3	0,096	3	0,096
	3,994		4,877		5,911		5,251	

The vijfkamplaan and the weegschaalstraat are sports accommodation specifically designed for the activities taking place there, resulting in a high productivity. The user satisfaction is rather average and the lowest for Kanaaldijk Noord due to its appearance, this affects the culture as well.

The specificity of the sports accommodations influence the flexibility in a rather negative way. The supporting image is as well rather low. The activities taking place are contributing to the wellbeing of the society and score therefore a good grade on innovation.

The financial position of the sports accommodations is rather poor due to its low marketability. The risk control and cost reduction are rather good.

Social real estate: community center

	lekstraat		werffstraat		lepenlaan		Koenraadlaan	
Improving productivity	4	0,82	6	1,23	7	1,435	8	1,64
Increasing user satisfaction	6	0,888	5	0,74	7	1,036	5	0,74
Improve culture	6	0,564	4	0,376	7	0,658	4	0,376
Improving flexibility	4	0,8	4	0,8	6	1,2	3	0,6
Supporting image	3	0,129	3	0,129	5	0,215	2	0,086
Increasing innovation	4	0,712	5	0,89	6	1,068	5	0,89
Reducing costs	6	0,414	6	0,414	8	0,552	5	0,345
Controlling risks	5	0,155	7	0,217	8	0,248	7	0,217
Improving the financial position	8	0,256	5	0,16	7	0,224	5	0,16
	4,738		4,956		6,636		5,054	

The productivity of the lekstraat is rather low since this object is not designed as a community center, the koenraadlaan is designed as community center resulting in a high score on productivity. The lepenlaan has a welcoming appearance and is relatively new which results in a high user satisfaction and culture. The werffstraat and koenraadlaan in contrast score low on user satisfaction and culture.

Since these objects are designed as community centers they are less flexible. Only the lepenlaan has physical space to expand. The image of the lepenlaan is average and higher than the other three due to its open and new appearance.

Since the lepenlaan is rather new the cost reduction and risk control a graded rather high. The financial position of the Lekstraat is rather high as well since it is a former house and located in a residential area.

Social real estate: cultural function

	Bilderdijklaan (Van Abbe museum)		Dommelstraat (Effenaar)	
Improving productivity	7	1,435	8	1,64
Increasing user satisfaction	8	1,184	7	1,036

Improve culture	7	0,658	6	0,564
Improving flexibility	5	1	3	0,6
Supporting image	9	0,387	7	0,301
Increasing innovation	7	1,246	5	0,89
Reducing costs	7	0,483	6	0,414
Controlling risks	5	0,155	4	0,124
Improving the financial position	4	0,128	2	0,064
		6,676		5,633

These two objects are designed specifically for their function and are considered as an icon in Eindhoven. This affects the productivity, user satisfaction, culture, and image in a positive way. Due to the uniqueness of these objects the grade on flexibility and financial position are rather low.

Own housing real estate

	Stationsplein		stadhuisplein		Fred. Eedenplein	
Improving productivity	6	0,918	7	1,071	6	0,918
Increasing user satisfaction	5	0,695	6	0,834	4	0,556
Improve culture	3	0,138	4	0,184	4	0,184
Improving flexibility	6	0,564	7	0,658	5	0,47
Supporting image	3	0,111	5	0,185	3	0,111
Increasing innovation	3	0,258	5	0,43	3	0,258
Reducing costs	5	1	7	1,4	5	1
Controlling risks	7	0,84	8	0,96	4	0,48
Improving the financial position	8	1,24	8	1,24	7	1,085
		5,764		6,962		5,062