

Finding the balance

Transformations for housing associations in the Netherlands

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ABSTRACT

Even though there is a housing shortage in the Netherlands one of the possible solutions, the transformations of non-residential buildings into housing, is on the decline (Centraal Bureau voor de Statistiek 2023). Even when the office market is oversaturated (Remøy et al. 2024). At the same time the government is looking to housing associations to create the much needed affordable housing, but they find it hard to find land to develop (Remøy et al. 2024). Transformations of already existing building can be sustainable solution to that problem. Surprisingly there is a research gap on the role of housing associations regarding transformations. There is literature on both housing associations and literature, but not much that combines these two concepts. In the literature transformations are realised by developers. But there are differences between housing associations and other developers. This is mostly reflected in their valuation of projects (Hoomans, 2019).

Therefore this research proposal will focus on the differences in values between nonprofit organisations and for profit organisations and how they compare. This research proposal will propose a qualitative research method. The instruments in this research used are interviews and focus group discussions. The interviews are used to create an understanding of both the assessment process and the prioritisation of different values regarding transformation projects. While focus group discussion with a heterogeneous group will set the values of the housing associations in regards to transformations.

Thus making it possible to create a valuation tool for housing associations when considering a transformation project. This would in turn possibly increase the amount of transformations by housing associations, but also give housing associations a better grip on what transformations entail so that they can make a balanced decision.

KEYWORDS - transformation, adaptive re-use, housing association, evaluation

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1. Introduction

The Netherlands is moving towards a circular economy (Ministerie van Infrastructuur en Waterstaat, 2024). To achieve this goal the circularity of the built environment needs to be massively improved as the construction sector is still one of the biggest polluters in the Netherlands (Feddes, 2025). Working on decarbonizing the construction sector while there is still a great demand for housing is the challenge. Apart from the current demands there is also the need make sure that there is enough capital for the future (CES, 2014).

The need is apparent and there is a growing sentiment that buildings should be transformed to the needed function instead of being torn down to make place for a new building. This trend is underlined with the new book of *Beter dan sloop* (Better than demolition) of Fred Feddes (2025), wherein there is a strong manifesto to keep every building, especially those built after world war 2.

The aim of this thesis is to promote that sentiment to the housing associations in the Netherlands. As they are key players in the development of new housing in the Netherlands and have been front runners in the realisation of transforming empty buildings into housing (van Bortel, 2024).

1.1 Problem statement

In the Netherlands there is a housing shortage. This housing shortage results in record long waiting lists for applicants for housing by housing associations in the Netherlands. It becomes more and more common to hear waiting times of more than a decade (Buijtendijk & Buijs, 2023). Therefore it has been a goal from the government to build more housing every year to combat this (Ministerie van Volkshuisvesting en Ruimtelijke Ordening, 2024). A big part of these new housing is expected to be affordable housing and therefore to be realised by the Dutch housing associations.

At the same time the Netherlands is trying to achieve a more circular economy (Ministerie van Infrastructuur en Waterstaat, 2024) and just building new isn't viable. It is taxing on the environment (Power, 2008) and available green spaces are in short demand in the Netherlands. Especially for housing associations in the Netherlands it has become hard find enough green spaces for new developments (Remøy et al., 2024). Therefore it seems logical that the transformation of already existing buildings, like offices, into housing should be one of the solutions. It reduces waste by re-using existing structures (Power, 2008) and transformations take less time to develop (Bullen & Love, 2011). The value of transformations of existing structures into housing also has been recognized by the government and been promoted by it (Ministerie van Binnenlandse Zaken en Koninkrijksrelaties, 2022).

And it seems that the time is perfect for it. Housing demand is at an all-time high, while the office market struggles with a rise in vacancy (NOS, 2024a). Furthermore the office market in the Netherlands is a replacement market (Remøy et al., 2024). This is important because that means that offices that are being replaced will most likely result in vacancy as the market is already saturated. Nevertheless in the last few years transformations of existing buildings into housing has been on the decline since 2019 (Centraal Bureau voor de Statistiek, 2024). This

seems odd, but according to the Dutch ministry of internal affairs it is mostly due to the fact that most of all the easy to transform buildings have been done. What is left are transformation projects that carry more risks, because of their unfavourable location for example (Ministerie van Binnenlandse Zaken en Koninkrijksrelaties, 2022).

Housing associations, previously front runners in the transition of existing buildings into housing (Remøy et al., 2024), are again considering transformations as part of the solution to develop enough affordable housing. At the same time housing associations themselves seem to struggle with how to evaluate transformation projects. During a scoping interview with a senior developer from a housing association in the Netherlands the process of evaluating a transition project was described as a 'black box'. There is a lack of standardisation and objectification of the process, making it harder to evaluate the project. It is the aim of this research to develop a tool and/or a basis on which housing associations can evaluate potential transformation projects (personal communication, [27-11-2024]). And according to Arge en Hjelmbrække (2012) the lack of strategic objectives and methodology of projects is a wider phenomenon seen in the construction industry.

1.2 Scientific relevance

Because of the importance of this topic the lack of scientific research on the topic is all the more surprising. There seems to be a knowledge gap. There is quite a lot of scientific research on transformation of offices and other utility buildings into housing. But in the context of housing associations research is lacking. For example in the book *Transformatie naar woningen 2024* (transformation to houses) by Hilde Remøy et al. housing associations are mentioned by Van Bortel (2024) but mainly in the light on how impactful they could be. But the scientific research is lacking in how the housing associations approach transformation projects, in stark contrast with the chapter about developers and transformations. This is important as housing associations differ in their goals from traditional developers. Most notably is the different stance towards profit. It is the assumption of this thesis that different values result from a for profit organisation in contrast to a not for profit organisation.

Furthermore housing associations have to abide by different legislation in the Netherlands, usually also operate their projects afterwards and have a different system of financing their projects. Because of this, this thesis forward that housing associations value projects differently than traditional developers. Therefore in this thesis the research gap between transformations and housing associations will be addressed.

1.3 Societal relevance

Changing the perspective of the lifetime of building and reusing more of the already existing stock is to the benefit of the society. It is one of the steps towards a more circular economy wherein extracting resources from the exhausted earth play a smaller role and making the real estate market more resilient to fluctuations in the supply of resources (Feddes, 2025). Furthermore by focussing on housing in this thesis, the housing market will also transit towards a replacement market wherein the supply meets the demand.

1.4 Research topic

This thesis will focus on the assessment of transformation projects into housing for housing associations in the Netherlands. Understanding the valuation of transformations will help in promoting transformation projects.

It is the assumption of this thesis that the value framework, or in other words their assessment tool, of for profit and non-profit organisations will have their differences on the development of housing within transformation projects. Examining the differences, overlaps and gaps in their valuation of transformation projects will result in a better understanding of the complex problem that transformation projects are.

The value framework of the 3P (People, Planet & Profit) will be used in this thesis to evaluate the values. As these three domains are widely accepted for sustainable development (Hanh et al., 2014). The three domains of people, planet and profit will be explored further in the existing literature.

The research narrows itself to the front-end of the project wherein the most differences still can be made (Rodrigues & Freire, 2021). Furthermore this is chosen as usually housing associations do not have unused utility buildings in their portfolio due to legal restrictions (Ministerie van Infrastructuur en Waterstaat, 2024a) and the acquisition of property is a significant investment (Conij, 2023). The front-end is the period before the acquisition of the potential transformation of the building.

From this the following main research question follows:

How can the transformation of buildings into housing be valued/evaluated within housing associations in the Netherlands at the front-end?

To answer the main research question, sub-research questions have been formulated. These are:

1. What are the values of assessment tools seen in existing literature for real estate developments?
2. What are the values of existing assessment tools for transformation projects from a for profit point of view?
3. What are the values of existing assessment tools for transformation projects from the housing associations in the Netherlands point of view?
4. Where do the values of for profit and not for profit organisations overlap, where do they conflict and what are the missing values?
5. How to balance/harmonize conflicting values and add missing values for transformation projects of housing associations?

1.5 Research aim and objective

The aim of this research was mentioned before to develop a tool and/or basis on which housing associations in the Netherlands can evaluate transformation projects. Due to the limited scope only a concept level tool will be achieved with this thesis. Or using the technology readiness levels (RVO, 2022), this thesis will limit itself to level two. To achieve this aim this thesis will compare and combine value assessments of transformation projects of both for profit and not for profit organisations. This will integrate the valuation methods for transition projects with the valuation methods of housing associations. Thereby connecting the already existing literature of valuation methods with housing associations and transformations and filling the knowledge gap that resulted from it.

1.6 Dissemination and audiences

Four preliminary presentations and one final presentation, thesis will be uploaded at the end of the research on the TU-Delft archive. The audience of this thesis will primarily be the housing associations and asset managers of housing associations in particular. This is because the tool, which is the final objective of this thesis should complement their knowledge of assessing projects.

1.7 Research outline

Figure 1 is showing the outline of this research.

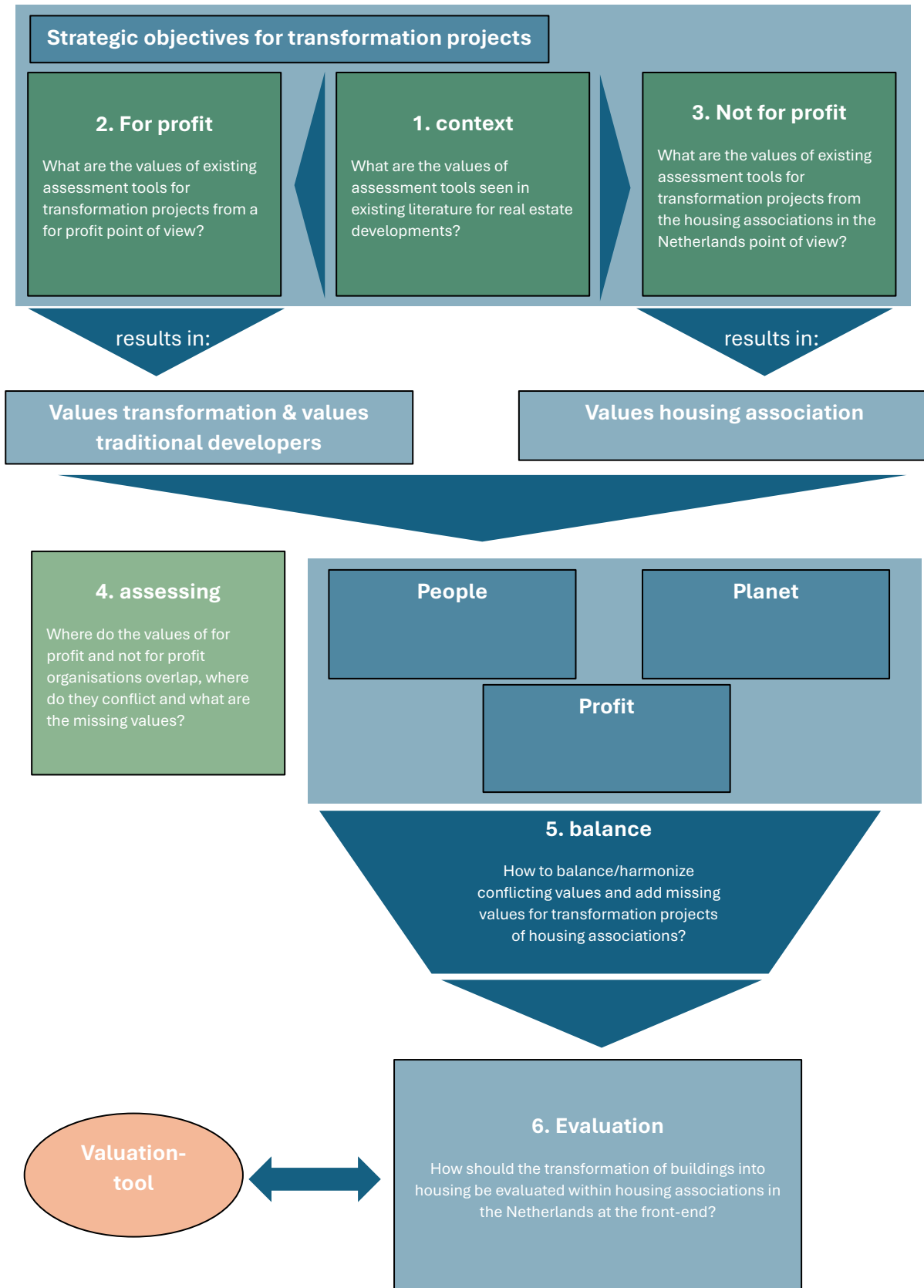


Figure 1: Conceptual model: Own work, 2025

1.8 Research time line

In the following time table the expected time for this thesis is laid out and divided between the different activities. Only the duration is given for the different parts of the thesis but not the intensity.

Expected time table thesis Peter Pápai

activity	starting week	expected duration in weeks	June							July				August				September				October			
			week 24	25	26	27	28	29	30	31	32	33	34	35	36	37	38	39	40						
acquiring last case	24	1																							
HREC application	24	4																							
DPM finalisation	24	2																							
preparing the interviews	25	4																							
conducting the interviews	28	4																							
transcribing the interviews	28	4																							
coding the interviews	30	5																							
documentation research	28	4																							
cross analysing findings	32	4																							
P3 presentation	35	1																							
expert panel	36	2																							
findings expert panel	36	3																							
results	34	4																							
limitations	36	4																							
discussion	38	2																							
reflection	38	2																							
conclusion	38	2																							
P4 presentation	40	1																							

Table 1: time table thesis, own work 2025

2. Methodology

2.1 Research Design

In the following part the research design will be discussed. An overview of the research design can be seen down below, table 2.

Table 2: Research design: Own work, 2025

Research question	Approach and method	outcome
SQ1. What are the values of assessment tools seen in existing literature for real estate developments?	<pre> graph TD A[Literature review Narrative literature review] --> B[Case study 1. semi-structured interviews 2. documentation] </pre>	Creating of a theoretical framework using the 3p-framework for the understanding the values regarding transformation projects.
SQ2. What are the values of existing assessment tools for transformation projects from a for profit point of view?	<pre> graph TD B[Case study 1. semi-structured interviews 2. documentation] --> C[Case study 1. semi-structured interviews 2. documentation research] </pre>	Insight in the values of for profit organisations regarding transformations.
SQ3. What are the values of existing assessment tools for transformation projects from the housing associations in the Netherlands point of view?	<pre> graph TD C[Case study 1. semi-structured interviews 2. documentation research] --> D[Cross case analysis] </pre>	Insight in the values of nonprofit organisations regarding transformations.
SQ4. Where do the values of for profit and not for profit organisations overlap, where do they conflict and what are the missing values?	<pre> graph TD D[Cross case analysis] --> E[Literature review Paradox perspective] E --> F[Focus group discussion / Expert panel] </pre>	An assessment on which values contradict each other between the different organisations, which values conflict, overlap or miss.
SQ5. How to balance/harmonize conflicting values and add missing values for transformation projects of housing associations?	<pre> graph TD E[Literature review Paradox perspective] --> F[Focus group discussion / Expert panel] </pre>	Establishing how different values need to be valued in the case of transformation projects.

2.1.1 literature review

The literature review is used to answer RQ 1 & 5. For RQ 1 the literature review is needed for understanding the existing literature needed for creating the theoretical framework, selecting the cases for the case study and for the basis of the interviews connected to the case study. The method for this literature review will be a narrative literature review. As this kind of literature review is good applicable in the development or advancement of theoretical models. As a theoretical framework is the desired outcome of RQ 1, this methods fits well. A big limitation of this method is the subjective nature in which the research takes place. The bias of the researcher decides the narrative (Rumrill & Fitzgerald, 2001). To combat this possibility of tunnel vision feedback from peers and supervisors is needed.

For RQ 5 the literature review is needed for understanding on how to harmonize conflicting values. For this the theory of paradox perspectives will be used as to relate the different values with each other and what possible consequences can be of neglected or missing values. This will feed into the focus group discussion together with the findings from the cross case analysis to give different perspectives on the given subject.

2.1.2 Case study

Case studies are chosen as to deepen the understanding of the literature and to also test the theoretical framework with what is seen in practise. The theoretical framework will be tested if values from the framework will overlap, conflict or miss. With these findings the theoretical framework will be revised for answering the main research question. The case studies will be chosen based on the literature review regarding to RQ 1 and based on their availability and comparability.

The case studies are the chosen research instrument for RQ 2 and 3. These research questions refer either to for profit or non-profit organisations and need therefore their own cases. These two will be compared in the cross case analysis for answering RQ 4.

Criteria for cases

Selection the cases will be based on three main principles: comparability, affordability and accessibility. In the following part the reasoning behind these three principles is further explored.

Comparability: The cases need to be comparable with regards to location, size, type of housing, original function and transformation level. As these things effect the both the investment costs and revenue. Furthermore with a limited amount of cases, it is important to have comparable cases as to not compare wildly different kinds of transformations.

- *Size and location* can affect the pricing and are mostly important for the economic value of the project.
- *Type of housing* as different target groups have different needs this strongly impacts the design. For example as houses with less than 50m² do not need an outside space like a balcony and some housing share some of the facilities.
- *Original function* is important for the design process and how to fit the new function into a building that is designed for another function.
- *Transformation level* varies between the projects. Re-using as much as possible is one of the main reasons to transform existing buildings. The transformation level will be determined using the shearing layers of architect Frank Duffy (Brand, 1994).

Differences between the developers have to exist as to achieve the findings for the sub research questions 2,3 and 4 as different developers may have conflicting views that may have to be reconciled.

Affordability of the housing is important as it is one of the key values between the social and monetary values of housing associations. Therefore it is important to use transformation projects that provide affordable housing. This is also important to keep the cases comparable.

Accessibility to the project and its documents is essential. Cooperation of the party is needed to achieve insights of the project needed for deeper understanding of the decision making and valuation process.

- *Assessment tool*, access to the used assessment tool and the underlying mechanisms is vital in understanding why certain decisions were made and which values were taken into consideration.
- *Cooperation for interviews* is also a requirement as to deepen the knowledge of the underlying information about the underlying processes.

Selecting cases

Based on the criteria and the selection available in the long list (see appendix 1) the cases were chosen. As the list of available cases from non-profit organisations is shorter it was reasoned to first choose two cases from that list. After reaching out to the organisations of those projects could be made a list of comparative aspects.

After reaching out to several housing associations only two cases were possible to further research. These cases are:

Zoeterlaarspassage: The transformation of office space above an indoor shopping mall in the Dutch city of Almere, with the possibility of adding an extra floor on the roof. The project has a GFA (gross floor area) of 5720 square meters with 90 houses with a floor area between 40 and 86 square meters each. There was no defined target group, it was all social housing. Organisation is the housing association de Alliantie. De Alliantie is prepared to share documentation on the case and to partake in interviews.

Helmerstraat: The transformation of a school into studios for starters, students and immigrants. Located in a prime spot in Amsterdam, the project has a GFA of 970 square meters with 23 studios, each ranging between 18 and 30 square meters. Important to note is the monumental status of the building before purchasing. Organisation is the housing association Rochdale. Rochdale is prepared to share documentation on the case and to partake in interviews.

Despite the two cases being dissimilar there are some overlapping aspects.

- *Size and location*: Even though the size differs quite a bit, both cases are located in a highly urbanised area.
- *Type of housing*: The floorspace of the houses differs but they are both independent living units and apartments. Furthermore they are both fully social housing.
- *Original function*: Schools and offices do not differ too wildly from each other to not be comparable as would be the case with for example transformations from industry.
- *Transformation level*: using the shearing layers of Frank Duffy both project retained their place and structure and most of their skin. For the other case something comparable is wished as to keep it comparable. As replacing the façade significantly impacts the building costs.

Based on these and the possible cases from the long list (appendix 1) a short list was made. The following cases are comparable enough to use for the cross case analysis.

- Hillside
- Narita
- Parkstaete
- De Entrée
- Witbautstraat

The respective parties were contacted and these are the cases of whom their associated organisations want to share.

Hillside: The transformation of an old office building into housing together realised with a newly built apartment complex in Amsterdam. In total 233 new social houses were realised with floorspaces ranging from 23 to 48 square meters. For the transformation only the place and the structure were re-used. The leading organisation is the developer B-right and they want to partake in interviews, but they can not share documentation regarding the case.

Another case is needed, but due to unforeseen delays and national holidays there is some delay.

2.1.3 Semi structured interviews

Semi structured interviews are flexible and give the researcher the possibility to explore aspects of the case study that are case study specific and may lead to new insights. Which is needed to answer the sub research questions 2 & 3. In the case of transformations it is a given that every project is different, therefore every case will most probably have specific points of interest. This is also the reason to not choose a questionnaire as the research matter is qualitative of nature and not quantitative.

The interviews are linked to the case studies. Each case will come with an interview to explore the values and valuations of their decision making process. Because there are four cases, there will also be four interviews. Two interviews with participants from the for profit sector and two interviews with participants from the non-profit sector. These four interviews will mostly be similar as to keep the findings comparable but the questions will be accommodated to their respective sectors.

The questions of the interview will be based on the literature study and will “hit” the nine aspects of the theoretical framework (see figure 3). This is to both test the theoretical framework if the participants can ‘connect’ with it and to make sure that both the ‘outstanding’ and missing values will be mentioned. Topics for the interviews can be seen in appendix 5.

The interviews will be online as to make it easier to record the interview and to transcribe it. It furthermore will reduce the amount of time and money spent on travelling. If a participant strongly prefers an interview in person that wish will be obliged as the participant's wellbeing is of a higher importance than the convenience of the researcher within reasonable limits.

2.1.4 Cross case analysis

The cross case analysis is chosen as to answer RQ 4. Wherein the findings of RQ 2 and 3 will be compared with each other to find matching, conflicting and missing values regarding transformation projects.

This will be done mostly by analysing the transcripts of the interviews. Using Atlas TI the interviews will be coded and used to find patterns and recurring themes between the cases. This will be done with the use of both deductive coding and inductive coding. The deductive coding is used to find alignment between the theory and the interviews while the inductive coding is used to find new insights on recurring topics.

The findings of the coding will be laid out in tables and illustrated with anonymised quotes from participants. Comparing these to the theoretical framework will give the answer to RQ 4.

2.1.5 focus group/expert panel

The reasoning behind the combination of focus group and expert panel lies in the desired output needed to answer RQ 5. A focus group discussion is often used to explore what the opinions of the participants are and the expert panel is to get new insights in this specific field. Both will be of value in answering RQ 5 as answering complex problems is in practice also often based on intuition (Sales et al. 2009).

The group will discuss matters based on the findings of the cross case study and the literature review. The theory used for the discussion is the paradox perspective, a method to analyse conflicting interests.

The focus group will not be homogenous, as participants from the housing associations will be joined by people from independent consultancies in the discussions. This is to ensure that all the participants have knowledge on the possibilities and limitations as a housing association in the Netherlands. The focus-group consists of about 4-5 people as all of the participants are considered experts. One of them is the researcher. The researcher fulfills the moderators function, which is to guide the discussion as a neutral bystander.

The focus groups will take place online as to be easily accessible to all participants and to make it easier to record the discussion. The duration of the discussion is expected to be around 120 minutes. In the following paragraph the outline of the discussion is sketched.

First the focus group starts with a short introduction of about 1 minute. Afterwards the participants will get acquainted with each other, mostly to get to know from which housing association they are and possibly what their goal is for that day. This will take about 10 minutes, about 1 minute per person. This will be followed by the discussion. The discussion will take place in three parts, each part correlating with one of the three P's from the theoretical framework. In each part the participants will see statements with the use of a presentation. They will first decide for themselves what their position is. Afterwards they will share their position with each other and discuss. The participants may revise their position on the matter after the debate has taken place. The ability to revise their stance may give insights in what strong arguments are for certain values and how perceived complexities may be tackled. A short break of about 5 minutes for in between the discussion points will be implemented as to prevent exhaustion. But also to facilitate informal talks between the participants over the subject.

2.2 Framing (methodology)

Following the four logics of inquiry of Blaikie and Priest (2019) this thesis will follow the retroductive logic for the first part of the research (sub-research questions 1-3) and an abductive logic of inquiry for the second part of the research (sub-research questions 4-5). The reasoning for these methods is that in the first part of the thesis the research focusses on discovering underlying mechanisms (retroductive) and in the second part to understand the actors (abductive) as to be able to create a valuation tool that fits the audience.

From the literature study will follow two main things. A theoretical framework and a list of criteria for cases to study. These will be the backbone for evaluating the case studies, both by examining the cases itself and for interviews regarding the cases. These interviews will create insight in the underlying mechanisms of assessment tools and the assessment process. The people interviewed will both be from for profit organisations and from nonprofit organisations. And will also give the underlying information needed to answer sub-research question 4.

With the findings of the first part a focus group discussion will be prepared. The findings will be tested to a group discussion as to hammer out any differences in view by the various participants. A focus group is usually limited in the amount of topics that can be discussed. Therefore beforehand a selection of the topics is important.

This will create a robust basis for a prioritisation of the values from the theoretical framework. With that the values can be harmonised and put in a valuation tool. These will be tested with evaluation interviews with experts from housing associations. As the research output is to serve the housing association.

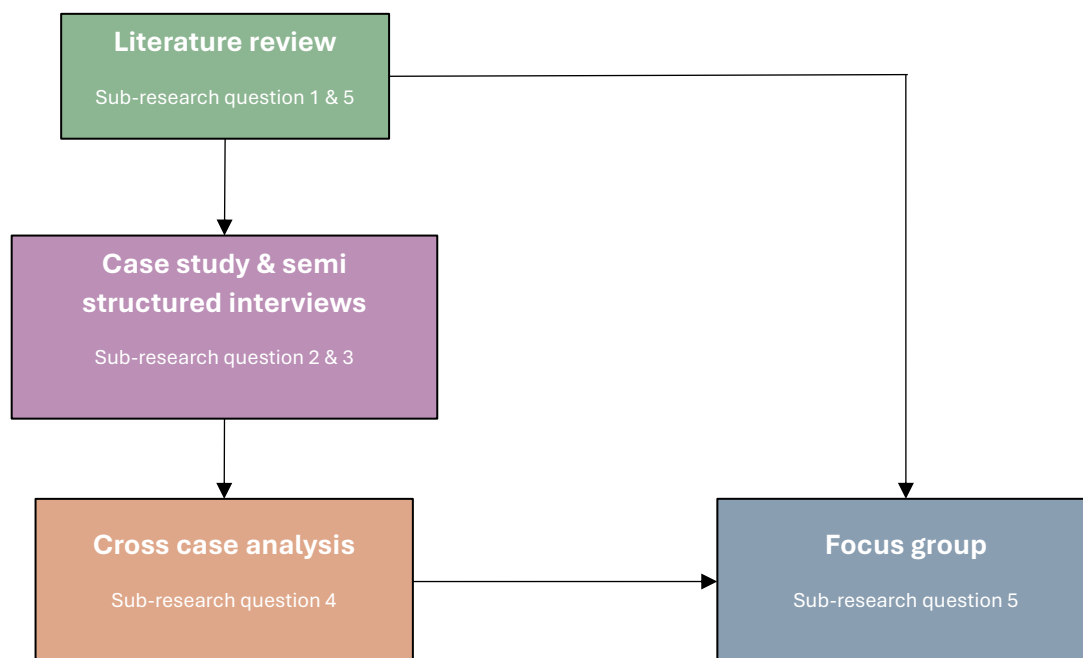


Figure 2: Research instruments framework: own work, 2025

2.3 Selecting (methodology)

This research will mostly focus on the decision-making process of housing associations. As valuation of the assets is an integral part of the decision making process in these developments

(Remøy et al. 2024) (Bullen & Love, 2011). Therefore asset managers of both profit and nonprofit organisations will be used for the semi structured interviews and for the focus group discussion. Independent consultants will also be asked to take part in the discussion as they usually advice both parties on matters such as sustainability, design and (construction) costs. Furthermore within housing associations independent advisors are almost always a requirement as to have a second opinion on matters of procurement and development.

2.4 Research Output

2.4.1 The goals of this thesis

The goals of this thesis are twofold as with the methods of inquiry. One part is to understand the assessment process as to be able to not only create a valuation tool that works theoretically but also fits the experience of the people who work on this topic in practice. The second goal of this thesis is to promote transformation projects as a possible solution towards housing associations. This will be done by promoting values that fit both the housing associations and transformation projects.

2.4.2 Objectives

The objectives of this thesis are as well twofold. First and foremost is the value framework. This framework will be used throughout the research and will be the basis on evaluation the case studies and the theoretical framework within this study will be framed. The framework should be easy to understand and easy to use as a possibility to evaluate existing assessments.

The second objective is the valuation tool. This should be an easy to understand, practical tool. That can be used with limited information of the project. But at the same time can make a clear assessment to make a decision clearer, unlike the black box some housing associations are experiencing now. It should also be usable throughout the first few design phases as decisions in these phases are the most impactful (Rodrigues & Freire, 2021). But due to the limited scope of the thesis this will not be a realistic objective. Therefore using the technology readiness levels (RVO, 2022) will this thesis limit itself to level two. The argument goes that just like with technologies, policy tools need to be developed from concept to application and with this thesis the concept is being set. Setting the groundwork for a proof of concept.

2.5 Research ethics and data management

In this part of the report the ethics and data management are reviewed. As it is important to that the research is methodological and morally sound for everyone involved. The thesis will go over the risks and countermeasures considering the validity of the study, the protection of its participants and data management.

2.5.1 Data collection

Participants will have to submit a written consent before their data will be collected. In the consent forms it is made clear that they can if they want to always discontinue their participation.

This goes for both the interviews as the focus group discussions. Participants may also request that their data will be removed.

2.5.2 Data management plan

2.5.2.1 Data storage and analyse

The data collected will only be accessed by the researcher and his supervisors. During the research the data needs to be easily accessible for the researcher involved. Therefore during the research all the data will be saved on the TU Delft OneDrive. After the completion of the research the data will either be destroyed or uploaded to the TU Delft Project Storage where the data is more secure.

For the interviews and the group discussion, the researcher will record the discussions on a temporary storage device. The data will as shortly as possible be transferred from the temporary storage device to the TU-Delft OneDrive and will be removed from it. After the audio file is fully transcribed and the research is published it will be destroyed as to prevent the risk that the identity of the participants will be made known.

The transcribed text and the collected notes of the focus group discussions will be after anonymisation and publication of the research be stored to the TU Delft Project Storage. During the research it will be stored on the TU Delft OneDrive. In the end all the data will either be safely stored to the TU Delft Project Storage or be destroyed.

Data will also be anonymised when processing the data. This is to ensure the protection of the participants. As has been mentioned before. For the people of the focus groups explicit consent will be asked for possible quotations of the transcript, which they may deny and still participate. Quoting participants may increase the risk of participants being linked to the research. This risk will be minimised by anonymisation of the quotations. Participants will therefore not be linked because of their position/profession.

2.5.2.2 Data sharing and preservation

For the data sharing and preservation all the information will stay confidential and the findings will be generalised when possible. Apart from the possibility that someone might link a quotation to a participant, there should be no way that personal data of the participants will be made public. The data will be deposited in the TU Delft repository, for future use by other researchers. This data stays in the repository for a duration of 10 years in accordance with the guidelines established by the TU Delft Research Data Framework Policy.

Sharing the data will help future research for similar studies. Therefore this research will adhere to the FAIR (findable, accessible, interoperable and reusable) principles.

2.5.3 Ethical considerations

2.5.3.1 Ethics: validity

Research needs to have both internal and external validity as a requisite to be morally sound. Internal validity focusses on the methodology. A research has internal validity if the research investigates exactly what it intends to investigate (Price & Murnan, 2004).

This research uses a qualitative methodology of both case studies with interviews and focus group discussions. Both research instruments are carefully constructed to aim to answer the intended research questions. The interviews of case studies are used as introducing the participants for the focus group discussions. This way participants will get a better understanding

of this study. Validity is also created during the interviews and discussion as the participants will be acquainted with the practice and thus will probably steer the discussion automatically in the direction of its intended purpose. In case that doesn't happen the researcher in its role as the moderator will steer the discussion back to the intended purpose, as to safeguard the validity. External validity is when the findings of the research represents what the outcome would have been had it been the entire population (Price & Murnan, 2004). In this case that would be hard to achieve as only a limited amount of the population will be contacted. But by using only experts for a specific topic can external validity still be reached.

The role of the researcher is important, as a bias can influence the outcome of the research. In this case the researcher is biased towards the transformation of offices into housing by housing associations. The researcher intends on promoting transformations with this research. To combat this the researcher will not participate in the focus group discussions and let a neutral moderator lead the discussions. Furthermore the researcher will let his research be peer reviewed its supervisors. This to ensure that the questions to the participants will be as objective and open-minded as possible. This should diminish in influence of the bias of the researcher on the findings on this research. Still because this research is about valuating, it is by its very nature subjective and not objective therefore the risk of bias remains (Marietta, 1997).

2.5.3.2 protection of participants

The voluntary nature of the interviews and focus group discussions are central to the protection of the participants. Participants will be well informed over the use, storage and publication of their data via the use of consent forms. They also keep the right to discontinue their participation without the need of a reason. This is to ensure that participants do not feel pressured to keep participating when they are confronted by discomfort or anything of the kind.

The protection of the data of the participants is also part of the protection of the participants. Participants for the interviews and focus groups will be contacted via e-mail. But there will be personal contact between the research team and the participants. For the publication of the findings of the focus groups data, including the transcripts and notes will be anonymised, while recordings will be destroyed after the publication of the research. As to minimize the risk that the participants can be traced back from the findings.

These will be ensured by applying before the interviews to the TU Delft human research ethics committee (HREC) for approval. This will ensure that the researcher will get feedback on its intended way of dealing with the participants.

2.5.3.3 Data management

For the protection of the data and to prevent problems in regards to data a data management plan is set up. This data management plan (see appendix 2) will be the basis of what data is collected and how it is stored and used.

3. Theoretical research

3.1 A 3P (People, Planet & Profit) framework of transformation for buildings into housing for housing associations in the Netherlands.

In the following chapter the literature review takes place to answer RQ 1. RQ 1 focusses on the values that are connected to transformations of housing and how these are assessed within the literature. From this a framework is laid out with which the case studies will be evaluated. The framework will be using the Conference of European Statisticians (CES) recommendations (CES, 2014). These recommendations aim to harmonize and guide sustainable development. The recommendations of the CES consist of a measurement framework and indicators of sustainable development. These are also used by Centraal Bureau van Statistiek (CBS) in their own framework called the monitor brede welvaart (Centraal Bureau voor de Statistiek, 2023). Which is widely used within the Netherlands to measure sustainable development. The applicability and wide use of the monitor brede welvaart are the reasons to use it as ground for this theoretical framework.

The framework Brede Welvaart uses three dimensions: quality of life, capital and boundary crossing effects. These three dimensions fit well the 3P framework of Elkington (1998), wherein people, planet and profit are the three dimensions. The 3P framework is a framework that tries to balance social, environmental and financial values to facilitate sustainable private development (Elkington, 1998). This fits well with housing associations in the Netherlands who are private organisations with a traditionally social point of view. With the relatively recent trend to develop more sustainable housing balancing these three aspects is key to successful development.

Balancing these three aspects also was promoted by Bratt (2012), who introduced the quadruple bottom line. It emphasises that housing associations usually were founded with a single goal in mind but that it in time goals regarding the residents (people), the neighbourhood (place) and affordable housing (finance) became intertwined with each other. While at the same time sustainability also became a growing aspect of these nonprofit organisations. Furthermore, Bratt (2012) gives ground for defining the domains within transformation projects.

Decisions need to be made, as the 3P framework of Elkington (1998) is too broadly defined and not specified for the development of housing. For defining the three P's in this framework key values with social, sustainable and financial aspects as in accordance with Bratt (2012) and the brede welvaart will be defined. The definitions of the three domains also limits the extend of the evaluation as to make it possible to come to a decision. In the following paragraphs the three domains will be explored, discussed and defined from existing literature, beginning with people, followed by planet and ending with profit. These will result in indicators (seen in table 3) that will indicate the values that will entail the theoretical valuation framework (figure 3).

3.2 People

The social value can be dived up in several parts. Using the CES (2014) recommendations, people are divided in human and social capital. Human capital is defined by the OECD (2001) as: “the knowledge, skills, competencies and attributes embodied in individuals that facilitate the creation of personal, social and economic well-being”. While social capital is about the interaction between people and facilitation of it. From these follow three aspects of the social

value: The heritage of the building, the future user of the building and the project position in the neighbourhood.

The future user of the building can be seen as the direct extrinsic value of the project, namely its human capital. While its position in the neighbourhood can be seen as its indirect extrinsic value. Namely how the project can be of value to the rest of the neighbourhood or in other words how it provides social capital. Important to note is that this is not about the other way around on how the neighbourhood values the project. The heritage value can be seen as the intrinsic value of the building that facilitates the other two aspects and refers best back to the building. Heritage is chosen as this paper is about transforming existing buildings, so there is always an existing heritage. In the following part the aspects heritage, future user and position in the neighbourhood are further explored.

3.2.1 Heritage

Heritage value is the value of a building depended on its cultural significance as used in the Burra Charter (Australia ICOMOS, 2013). The choice of the Burra Charter over other heritage valuation frameworks is its focus on the perceived value by its users and by first understanding the significances of the place before making any further decisions. Furthermore its usage of working with past, present and future fits well with the recommendations of CES (2014). Cultural significance according to the Burra Charter consist of the social, spiritual, historic, scientific and aesthetic value a place provides towards its users. These values are mostly subjective and are depended on the use of the building. It is therefore important to see how the future use of the building can increase or preserve the heritage value of the building.

Social

In the past the intrinsic value of heritage was thought to be found in mostly the historic and aesthetic value of the heritage (Jones, 2016). But in the previous decades the social value became a more central point of the conservation effort of heritage. The social function is mostly depended on its use, for example the practice of religion. As this paper will mostly focus on the people and less on the conservation of the building, this paper will follow the definition of Johnston (1994:10).

“social value is about collective attachment to places that embody meanings important to a community.”

The hard part of social value is that is highly qualitative and not a stable value. E.g. a church that losses its religious community also losses its social value. This value is also the overlapping value with the position of a transformation project in its neighbourhood that will be discussed later on.

Spiritual

the spiritual value a place is strongly connected to the social value in a sense that it is a value based on the perspectives of the community toward a certain place. Therefore in this thesis there will be made no distinction between these two values.

Historic

the historical value a place has to due to past events that were and/or are impactful to the (local) society. In that sense a historic value is not the same as the age of the building. The historic value is the product of both age and (past) social value (Australia ICOMOS, 2013).

Scientific

Is the value a place contributes to scientific understanding. This is usually the archaeological potential of the site (Mackay, 2019). This strongly differs from building to building and can be seen both as an opportunity and as a risk (Tencer et al., 2024).

Aesthetic

This is a purely subjective value that fully depends from person to person. Something also might be considered ugly but also familiar and therefore valued. Therefore a building that is generally considered ugly still can have an aesthetic value. (Remøy et al., 2024)

Understanding the cultural significances of a place makes it easier to make weighted decisions on preserving “the place itself, its fabric, setting, use, associations, meanings, records, related places and related objects.” (Australia ICOMOS, 2013, p. 2) The same could be said in deciding in what to preserve while transforming a building.

3.2.2 The future user

As this thesis is about the transformation of a building with a complete shift in function the current user is not consulted as that mostly has to do with the heritage value of the building. The value of the transformation for the future user is depended on the users satisfaction (Kowaltowski & Granja, 2011). Furthermore ensuring human capital within the project is needed to ensure its future sustainability (CES, 2014). Although the recommendations of CES (2014) are mostly focussed on the productivity of the human capital it also underlines the importance of the wellbeing of the people. The main values for the user satisfaction used for this framework will be: the accessibility, affordability and use value of the transformation.

Accessibility

Accessibility of housing in this case has to do with the accessibility of the transformation project. E.g. job accessibility (Jiang et al., 2020) or the presence of amenities in the neighbourhood. It also directly effects the affordability, as the cost of living in low accessibility directly impacts the finances of the user (Fisher et al., 2009). Accessibility may also mean the physical accessibility of the house for the user, which needs special attention especially in cases of disabilities (Lakhani et al., 2019). But due to the limited scope of this thesis, this will not be taken into the valuation.

Affordability

Affordability is not restricted to rent-prices alone, as was mentioned previously. Affordability is a multi-faceted concept, which makes it hard to measure. The importance of affordability is great as it directly effects the (financial) wellbeing of the user (Luffman, 2006). This thesis will limit its scope to the housing costs, e.g. rent and not to the extra costs created due to other factors like the accessibility of the housing or the energy costs. As these costs will either already be accounted for in the valuation of the other values or make the framework too complex.

In the Netherlands households spend on average about 23% of their income on housing (Centraal Bureau voor de Statistiek, 2024). Affordability is depended on what share of the household income is used for rent. The higher the affordability the greater the residual wealth for the occupant.

Use-value

Glumac & Islam (2020) researched the user satisfaction of transformation projects. The use value is depended on the needs of the future user and the quality of the place regarding those needs and they didn't find great differences between reused non-residential buildings and residential buildings. They did find heterogeneity on the demand side and promoted user participation to further explore the future users wishes (Glumac & Islam, 2020).

3.2.3 Position in the neighbourhood

A project within a neighbourhood will influence the neighbourhood both during construction (Almahmoud & Doloi, 2020) and after delivery (Eibach & Historisches Institut der Universität Bern, 2014). The potential and existing values or lack thereof within a potential transformation project therefor needs to be explored. Beside the social sustainability aspect, the (market) value of the project is also strongly depended on its location and its role therein. Therefore maintaining and/or improve its role in the neighbourhood is important. Values that need to be pursued are strongly depended on the location but the ones used in this thesis will be: diversity, community and supportiveness. These are also supported by the recommendations of CES (2014), highlighting the importance of social capital to ensure good quality of interpersonal relations and trust between people.

Diversity

The main justification for promoting diversity within a neighbourhood are empirical findings of that disadvantaged individuals are harmed by sizable disadvantaged groups in their neighbourhoods. Therefore the mixing of people with different social-economic backgrounds are seen as a possible remedy for these individuals (Galster & Friedrichs, 2015). This fits well with the quadruple bottom line of Bratt (2012) and more specifically with its interpretation of the neighbourhood.

Community

Savelli and Morstyn (2021) argue for the bonding of people through shared values and through familiarity with each other to achieve a local energy system. Key take away for this thesis is the importance of the social relationships within the neighbourhood and how it empowers the community to take action. Illustrative example is the action the neighbourhood of Vreewijk took towards the plans of demolition. Therefore the creation or conservation of a community in a neighbourhood should be one of the key values when designing a new development. It differs from supportiveness in this thesis. While community empowers the community towards common threats and possibilities, supportiveness empowers the household towards threats and possibilities with the help of the community.

Supportiveness

In the conference paper of Eibach & Historisches Institut der Universität Bern (2014) describe how neighbourhoods were in the past bastions of support towards each other. Although Eibach may have romanticized the past a bit he describes the supportiveness in twofold. Firstly as a first help in times of economic hardships and secondly in helping each other in with their stages of life, e.g. an elder person advising a young couple on childcare and fit neighbours helping a sick neighbour. An important requirement for this supportiveness is openness, both materially (like being able to look through someone's window) and socially with the house being accessible to neighbours during certain hours of the day or even the whole day.

3.3 Planet

The planet has to do with the environmental sustainability of a project. As has been noted by Remøy et al. (2024) sustainability is one of the main reason to choose transformation instead of newly built. As all good things come in threes, also for the planet there are three things to consider that are found in the book and within the CES recommendations (2014). The circularity of the project, the energy transition and the ecological value of the project*. These also follow the CES themes of land and ecosystems, energy resources and mineral resources.

*the ecological value doesn't have its own chapter and/or parts in the book but is a requiring value throughout the book and is therefore chosen.

3.3.1 Circularity

The main strength of transformation is in the reduction of waste and the redefining of the lifecycle of a building (Khadim et al., 2023). There is the Building Circularity Indicator to indicate the circularity value of the building using the different 'shearing layers'. Or the practically more used in the Netherlands the MPG-calculation. MPG-calculations are already legally required for newly built housing (RVO 2024).

The strength of the BCI is that it shows the amount of waste and focusses more on the lifetime and the demount ability of the resources used. The usage of it does require significant amount of data which hinders its implementation (Khadim et al., 2023). While the MPG-calculation is purely focussed on the amount of CO₂ a project produces during the construction of it. Both require a lot of information to come to reliable conclusions.

But a method to predetermine the circularity value or waste production isn't seen in the literature as of yet. This is possibly because of the lack of the homogenic usage of the MKI (Dutch: Milieukostenindicator; English: Environmental costs indicator) (Fraanje et al. 2021).

3.3.2 Energy consumption/transition

The energy consumption is important as it is both a legal requirement and can have a strong impact on the affordability of the housing it creates. Aedes uses "*de standaard*" to define what is an desired level of energy consumption. These levels are depended on the age, the type and the compactness of the building. Focussing on energy consumption rather than the widely used energy labels is a shift from the input (insulation) to the output (energy usage) and since the output is the desired goal it is better to measure the energy consumption (Aedes, 2021).

The energy transition mostly has to do with the type of energy that is used. There is a goal to be clear from natural gas and have all electrical homes. The electricity needs to come from sustainable sources and may be produced at the site with the use of solar panels. It is an important part of creating *BENG** housing but is often not legally required for the transformation of buildings.

**Bijna energie neutral gebouw*, almost energy neutral building.

Energy efficient housing is also beneficial for the market value of the housing, housing with an A-label are about 6,3% more worth than housing with energy label C (Chegut et al., 2016).

Therefore it can be argued from a monetary perspective for energy saving investments apart from the beneficial effect towards the affordability of the house.

3.3.3 Ecological

There is a growing interest in the ecological value of the built environment, illustrative of this is the backlash the Dutch minister Keizer received from not requiring nesting places in the façades of new developments (NOS, 2024b). The ecological value of a building can be both intrinsic (e.g. nesting places in the façade), extrinsic (nitrogen emissions) or both (green façade). This intrinsic, extrinsic divide can also be seen as the use values and non-use values as seen in the total economic value framework as used by CES (2014).

In the Netherlands the nitrogen emissions are the most impactful on the success of the project as there are strict legal requirements and limitation wherein the construction needs to be done. Therefore this value is mostly seen more of a risk than a value (Vugts et al., 2023). Using the nutrients balance is also recommended by the CES (2014).

The intrinsic ecological value has bigger impact. Especially the wellbeing of the users is positively influenced by it. But wrongly designed it will have a detrimental effect on the building costs (Rodrigues & Freire, 2021). Useful implemented ecological investments will also increase the market value of the building (Zeeuw, 2018). It is hard to measure added ecological value to a project, CES (2014) uses added area of green or protected land. Though quantity may not say anything about the quality of the added green, it is a easy way to compare projects.

3.4 Profit

Profit is needed, as a lack of monetary funds is (one of) the biggest bottleneck of housing associations in the Netherlands. This lack of funds has to do with several developments. The rise of building and maintenance costs, the energy transition especially in the existing stock and the sheer amount of developments needed to address the housing crisis in the Netherlands (Ministerie van Volkshuisvesting en Ruimtelijke Ordening, 2024). Therefore creating stock that will reimburse the investment and become profitable is needed. But to the rise in investment costs it becomes harder to achieve a reasonable Internal Rate of Return (IRR). Therefore housing associations look more towards the market value of a development to justify the investment. This works as the monetary value of housing due to housing crisis has been increased (maybe even inflated). It does make housing associations vulnerable to the market. Thus increasing the risk that the loan to value relation will worsen and dampening the investment opportunities of the housing association (J. Conijn, 2023). Also in the CES (2014) recommendations monetary capital is noted as an important part of sustainable development especially the handling of financial capital. Especially in retaining investment possibilities in the future, falling in line with the conclusions of Conijn (2023). He also splits up the finances in three parts, exploitation, transformation and expansion. Wherein the first part is about balancing the budget, the second part about the alterations in the finances due to demolition and sell offs and the last part about investing in new developments.

These three compartments are also the basis for the following monetary values for this theoretical framework. For the exploitation the theoretical framework will focus on the investment costs as therein lies the biggest difference in comparison with green field developments. The second compartment will be about the market value as it has the biggest impact if the building were to be sold off. Lastly Internal Rate of Return (IRR) and risk are tackled

as they are important (together with the investment costs) for the deciding on new developments.

3.4.1 Investment costs

Building costs are on the rise and still the biggest part of the investment costs. The rise of the building cost is a culmination of several developments. A chronic shortage of construction workers, rise in energy prices due to the Ukraine war, the rise and elusiveness of the installations costs and an ever enlarging list of legal requirements for developments. Transformation project can be a solution to this 'growing' problem as much of the building is already built, but also very depended on how easily the new function fits in the project. Furthermore circular construction solutions usually bring have greater initial costs than traditional construction and therefore scare of potential circular developers (Pape et al. 2025).

In general decisions taken at the front end and early design phases of the project have the greatest impact on the (construction) costs. It is therefore important to assess well at the front end as delaying decisions are detrimental for both the costs as well as on other values (Rodrigues & Freire, 2021).

In the case of transformation the procurement of a building is needed in the case for housing associations as housing association are usually not legally allowed to own non-residential functions without developing them within a certain timeframe (Ministerie van Infrastructuur en Waterstaat, 2024). This is a risk and differs from 'normal' green field development. Ground costs are regulated for social housing, but there is no real regulation for the procurement of transformation projects. Procurement costs strongly depend on the assistance of municipalities.

Other costs that are part of the investment costs do not significantly differ from standard developments and will be outside the scope of this thesis.

In general, minimizing the investment costs is essential for the profitability of the project. The most impactful phase to minimize these costs is in the front end and early design phases of the project.

3.4.2 IRR & Risk

The internal rate of return (IRR) is the annual rate of growth that an investment is expected to generate. The higher the IRR the faster the project will reimburse the costs of the investment. As Conijn (2023) stated, it has become harder for housing associations to keep a reasonable level of IRR. This makes it harder to finance investments and costs in the future.

Risk is also important when talking about IRR. Usually IRR is also taken as a benchmark on the amount of risk a project make have or in other words the project will be risk-adjusted (Yan & Zhang, 2022).

IRR is also usually preferred instead of NPV (net present value) because it is easier to understand. Net present value is the sum of the expected cashflows together with the investment costs, in the Netherlands usually used to determine the residual ground value. The advantage of using NPV is understanding how time effects the value. It does not however say when an investment will get positive, which is important to make new investments in the future (Conijn, 2023) (Yan & Zhang, 2022). Therefore this thesis will focus on the IRR and not on the NPV.

3.4.3 Market Value

As previously mentioned it becomes harder for housing associations to create housing with a desirable rate of return. Because of that the market value of the project is growing in importance when assessing a project as in a worst case scenario the market value of the project will cover the costs of the investment. Relying on ever-growing housing prices to fix the LTV (loan to value) is a risky strategy (it is literally the definition of an economic bubble). But it is a way how housing association may be able to keep investing even though there is a lack of funds.

At the same time housing association may create a market wherein it is financially desirable to have a housing shortage as to keep the market value of their stock (over)valued. This will conflict with other values of the housing associations. Therefore the thesis will follow Conijn (2023) in his advice to fix the cashflow and not to rely too much on market value.

3.4.4 Existing valuation methods

Tools to value transformation projects have been developed over the years. This thesis will go over the ones mentioned in the paper of Wilkinson et al. (2014). These are: The transformation meter, programmatic quick scan, architectural value, the architects' method & the ABT Method. In the book *Transformatie naar woningen* of Remøy et al. (2024) there is also an assessment tool regarding heritage for selecting the best fitting function for the transformation. But since this thesis already presupposes the transformation to housing this assessment tool will not be mentioned.

Overall are existing methods important to determine the program and to explore possible risks. Therefore these methods are of use in determining the profit part of the 3P framework.

The transformation meter:

The transformation meter is a decision tool made for the transformation of offices into housing. Using 5 steps to make a quick scan based on physical aspects and location. Vacancy duration is seen as one of the most important criterium, but isn't seen as a veto (go/no-go) criterium. The veto criteria are assessed in step 1. These are demand for housing, location, and (dimensions of) the buildings structure. Step 2 & 3 are the scan of the transformational potential of a building. In general location is weighted more than the quality of the building. Step 4 is a financial feasibility scan, especially focussing on the structure/façade and installations as these have the biggest impact on the potential building costs. The last step, 5, assessing possible risks of the development and construction phase. This should give the developer an understanding of the possible risks and benefits (Wilkinson et al., 2014) (Remøy et al. 2024).

The programmatic quick scan:

The programmatic quick scan is a four-phase scan that looks into how to fit functions into an already existing location. It is a design method that has as a benefit that it conveys clearly the possibilities of an existing building (Wilkinson et al., 2014). But it seems like a rather tedious process as the feedback loop is at the very end of the process diagram, something that should be tried to avoid (Koutamanis, 2022). The architects' method is a methodical way of studying and analysing by designing a transformation of a project. It resembles the practical application of the beforementioned programmatic quick scan.

Architectural value:

Architectural value is a method instead of an assessment tool. It assumes three layers of time: commencing, ageing and continuing. Within this timeframe the building elements of space, structure, substance and services are studied. It is mostly a method of determining the economic value of an existing building (Wilkinson et al., 2014).

The ABT Method:

The ABT method consist of three steps: inspecting the building, controlling and valuing beside these also assessing the condition, legislation and quality of the location. The method is structured as a tree diagram (Wilkinson et al., 2014).. It has lot in common with the architectural value method, but it divides the building in different parts instead as a whole. Therefore useful in projects where partial transformation will take place.

3.5 Theoretical framework

In this paper the theoretical framework is based on the 3P framework of Elkington (1998) wherein the three pillars of sustainability are defined by the indicators given by the recommendations of CES (2014). In table 3. the relationship between the theoretical framework and the theory is made clear.

Using the table as the basis, the theoretical framework is shown in figure 3. Wherein each of the three P's is supported by three aspects of their respective domains. Each based on the recommendations of CES (2014).

As already mentioned the theoretical framework will be used for the case studies. First and foremost the topics for the questions in the interviews will align with the indicators as seen in table 3. In a way the interviews are structured by these indicators. Furthermore these indicators will also be the basis for the deductive coding when extracting the findings of the interviews. At the same time, the case studies will also give feedback on the framework regarding missing values.

Theoretical framework		based on CES (2014)			
3P	(Elkington, Indicator/value	https://un. page	indicators	define	further literature
People					
	-Heritage	-Physical ir CES (2014) P 48	- Social	social attachment	(Australia ICOMOS, 2013) , (Jones, 2016) & (Johnston, 1994)
			- Historic	History of the place	(Australia ICOMOS, 2013)
			- Scientific	perservation of archaeological sites	(Australia ICOMOS, 2013)
			- Aesthetic	perservation of architecture	(Australia ICOMOS, 2013) , (Remoy, 2024)
	-Future User	-Human ca CES (2014) P 95	- Accessibility	(%) available for targetgroup	(Jiang et al., 2020) , (Fisher et al., 2009) & (Lakhani et al., 2019)
			- Affordability	(%) affordable for target group	(Luffman, 2006)
	-Neighbourhood	-Social cap CES (2014) P 45	- Use-value	usable for target group	(Glumac & Islam, 2020)
			- Diversity	socio-economic status	(Galster & Friedrichs, 2025) & (Bratt, 2012)
			- Community	connectedness neighbourhood	(Savelli & Morstyn, 2021)
			- Supportiveness	connectedness households	(Eibach & Historisches Institut der Universität Bern, 2014)
	Planet	-Natural capital			
	-Circularity	-Mineral re CES (2014) P 171			
			- Waste creation	BCI	(Khadim et al. 2023)(Remoy, 2024)
			- CO2 production	MPG	(Fraanje et al. 2021)
	-Energy consumption	-energy re: CES (2014) P 171	-Energy usage	kWh/m²/year	(Aedes, 2021)
			-Energy transistion	% renewable energy	(Aedes, 2021)
	-Ecological	-ecosystem CES (2014) P 33	-Use values	Added "green" in tonnage	(CES, 2014)(Rodrigues & Freire, 2021)(de Zeeuw, 2018)
			-Non use values	Emmision of nitrogen	(CES, 2014)(Vugts et al., 2023)
	Profit				
	-investmentcosts	-Financial CES (2014) P 95	- Building costs	€/GFA	(Pape et al. 2025)(Rodrigues & Freire, 2021)
			- Ground costs	€/m²	(Ministerie van Infrastructuur en Waterstaat, 2024)
	-IRR&risk	-Economic CES (2014) P 95	-IRR	%	(Conijn 2023)(Yan & Zhang, 2022)
	-Market values	-Physical c: CES (2014) P 133	-Risk	Checklist risk (transformatiemeter)	(Wilkinson et al. 2014)
			- LTV	<85%	(Conijn 2023)
			- Market value	€	(Conijn 2023) (Wilkinson et al. 2014)

Table 3: table with an overview on how the literature is connected to the theoretical framework, own work 2025

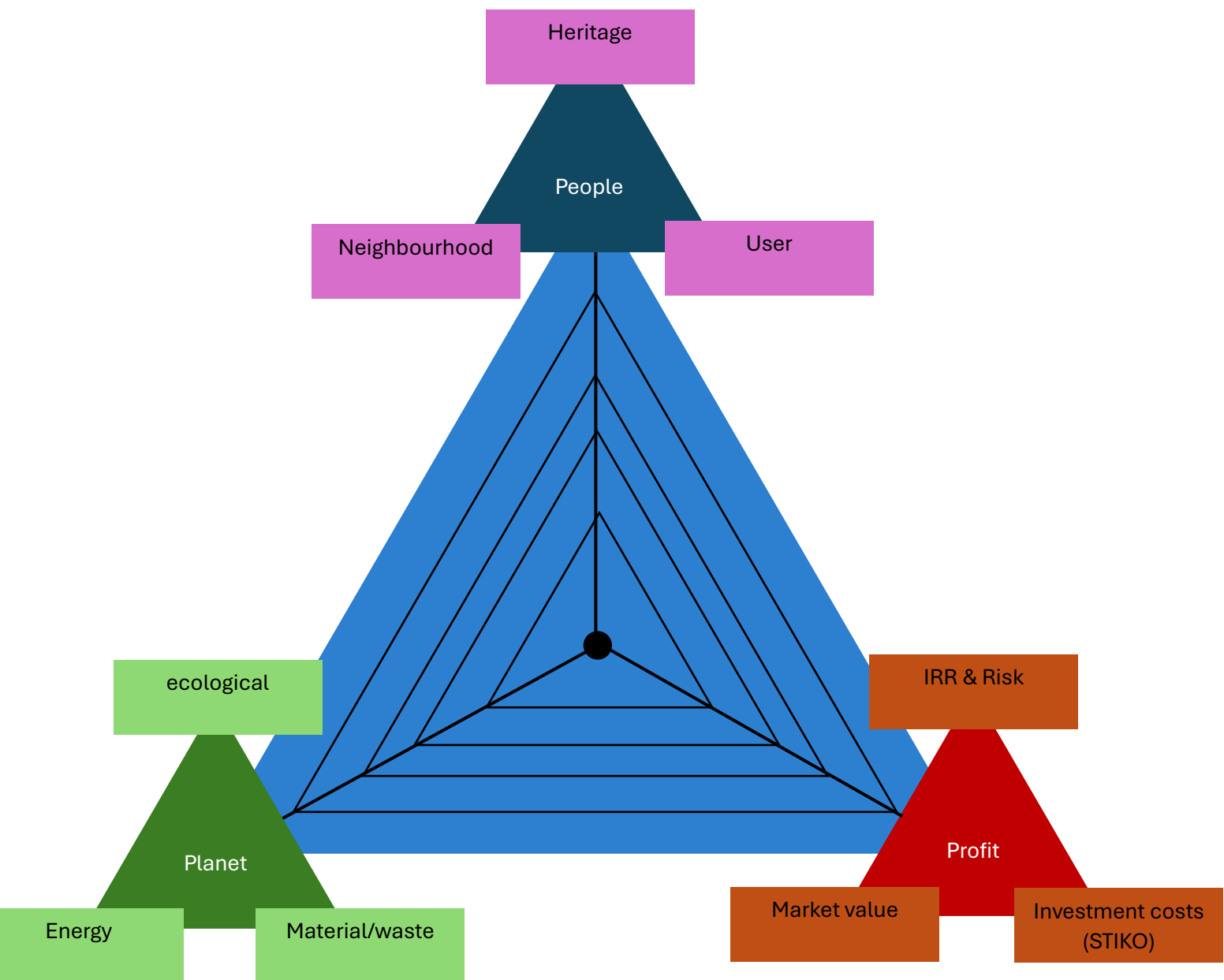


Figure 3: valuation framework: Own work, 2025

3.6 Paradox perspectives

Combining the previously mentioned values of the framework will result in conflicts of interests. Greco (2024) mentions that only focussing on one aspect (e.g. energy transition) will be detrimental for other aspects (e.g. the aesthetics) of the building. In the case of transformations this is even more paramount as these kind of projects are complex in nature and often the solutions implemented are not optimal (Filippidou et al. 2017). To combat this paradox perspective is a possible solution.

Paradox perspective has long list of beneficial effects when used. Greco (2024) sums them up as follows: the development of new strategies (Smith et al. 2013), achieving multiple goals at the same time (Smith & Besharov 2019), fastens innovation (Raisch & Zimmermann 2017), improves sustainability (Jay 2013) and is beneficial for the creatives process (Rubin et al. 2023). Important for this paper is the development of new strategies as that is the main point of this paper.

This method puts seemingly contrasting concepts and values together and compares them with each other. It differs from trade offs in the sense that it is not an either or question but acknowledging that the decision is multifaceted. Paradox perspectives does not magically solve the problems created by conflicting values, but it will give a better understanding of the problem at hand and what the unintended consequences will be if ignored (Greco & Long, 2022).

The value of using paradox perspectives in relation with the 3P framework was already underlined by Hahn et al. (2014). Realising the conflicting values between the three domains of economic, environmental and social, they developed a framework on how to use paradox perspective within that framework. This framework will not be used in this thesis fully utilised as the framework is based on long term development of sustainable policy. It will be promoted as a possible way to further develop the valuation framework of this thesis in the future.

4. Empirical research

5. Cross case analysis

6. Focus group discussion / expert panel

7. Discussion and limitations

8. Conclusion and recommendations

9. Reflection

9.2 Personal study targets

The thesis will be a hard nut to crack for me personally. I not quite sure, but I have often (and probably still do) underestimated myself. Due to my special form of autism, I was late in developing my language skills. Because of that I was constantly estimated to be less intelligent than I really was during primary. Therefor I still dislike writing and always presume that it does not account to much, at least not compared to my peers. A personal goal will be to take another step in overcoming this "mind block" by keeping up the work and repeatedly receiving feedback both academically and socially from my mentors, study advisors, colleagues and peers.

Another study goal of mine is to try to combine my master and work with a social goal. It is the basis for including the housing association in my thesis. As I work as a construction cost advisor beside my studies I got the feeling that I was creating financial value for the already wealthy. I want to be able to reconcile my work and study with a robust moral framework of my own. Therefore I also create the valuation framework as mirror to myself, what do I find most important and is it ethically sound. I want to end this thesis with a better understanding of what I find important and that they will guide both my personal and professional life thereafter.

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Appendices

Appendix 1. longlist cases

Longlist transformation projects for profit

Project	Developer	City	Transformed from:	Layers re-used	GFA	Type housing	Target group	access
Metamorfose	Steenvlinders	Rijswijk	Office	2	<10.000m ²	80-195m ²	Middle/high income	High chance
De Kroon	Dura Vermeer	Zoetermeer	Office	3	<5.000m ²	80-220m ²	High income	t.b.d.
Hillside	B-right	Amsterdam	Office	2	<5.000m ²	<50m ²	social	t.b.d.
Narita	Maarsen groep	Amsterdam	Office	1,5?	20.000m ²	50-120m ²	30/40/30	High chance
Parkstaete	Van Wijnen	Leerdam	Office	4	<5.000m ²	20-52m ²	Middle income	t.b.d.
't Goylaan 125	Van Wijnen	Utrecht	Office	2,5	<5.000m ²	82-92m ²	Middle/high income	t.b.d.
Gele Scheikunde	Amvest	Delft	Faculty/lab	2	>20.000m ²		mix	High chance
Rotterdamsche school	Vorm	Rotterdam	School	3	<5.000m ²		High income	t.b.d.
De Entree	BAM wonen	Leiderdorp	Office/lab	2,5	6.910m ²		Social & care	t.b.d.
Witbautstraat	BAM wonen	Amsterdam	Office	2	16.100m ²	35-88m ²	mix	t.b.d.
Het oude belastingkantoor	explorius	Apeldoorn	Office	3	<10.000m ²		High income & care	t.b.d.
Voormalig hudsonbay pand	3w real estate	Haarlem	Shop	3	18.000m ²		High income	t.b.d.
De Baronie	Green real estate	Alphen aan de Rijn	Factory	3	>20.000m ²		Middle/high income	t.b.d.
Marktpllein	Segesta group	Hoofddorp	Office	3?	<5.000m ²		Middle/high income	t.b.d.
groenhof	Segesta group	Amstelveen	Office	3?	<5.000m ²		high income	t.b.d.

Hof in de Egelantier	Lingotto	Haarlem	hospital	3	<10.000m ²		High income/hotel	t.b.d.
Het museumkwartier	BPD	Vlaardingen	Fishing centre	3	>20.000m ²	45-144m ²	Middle/high income	t.b.d.
Karzernekwartier Crailo	BPD	Gooise meren	barracks	3	>20.000m ²		33/28/39	t.b.d.
De Kerverij	Ingenious group	Veenendaal	factory	2,5	<5.000m ²		unknown	t.b.d.
Seahorse	vanwonen	Hengelo	factory	2	<10.000m ²		unkown	t.b.d.

Longlist transformation projects non-profit

Project	Developer	City	Transformed from:	Layers re-used	GFA	Type housing	Target group	access
Helmerstraat	Rochdale	Amsterdam	School	3	<1.000m ²	20-25m ²	social	yes
Zoetelaarspasje	De Alliantie ontwikkeling	Almere	Shopping centre	3	~5.000m ²	40-50m ²	social	yes
Lucentterrein	De alliantie ontwikkeling	Hilversum	Office	2	<10.000m ²	m ²	social	High chance
De Gravin	Woonstad	Rotterdam	Office	2	<5.000m ²	m ²	social	t.b.d.
Europalaan	Stichting Woonbedrijf SWS.Hhvl	Eindhoven	Office	3	<5.000m ²		social	t.b.d.
De Cajuit	Woonbedrijf	Helmond	School	3	<5.000m ²		Social	t.b.d.
Kootwijkstraat	Woonbedrijf	Eindhoven	School	3	<5.000m ²		care	t.b.d.
Barrierweg	Woonbedrijf	Eindhoven	School	3	<5.000m ²		Social	t.b.d.

Appendix 2. Data management plan

A Data Management Plan created using DMPonline

Title: Master thesis MBE transforming buildings into housing for housing associations in the Netherlands with interviews and expert panel

Creator: Peter Pápai

Affiliation: Delft University of Technology

Template: TU Delft Data Management Plan template (2025)

Project abstract:

Even though there is a housing shortage in the Netherlands one of the possible solutions, the transformations of non-residential buildings into housing, is on the decline (Centraal Bureau voor de Statistiek 2023). Even when the office market is oversaturated (Remøy et al. 2024). At the same time the government is looking to housing associations to create the much needed affordable housing, but they find it hard to find land to develop (Remøy et al. 2024). Transformations of already existing building can be sustainable solution to that problem. Surprisingly there is a research gap on the role of housing associations regarding transformations. There is literature on both housing associations and literature, but not much that combines these two concepts. In the literature transformations are realised by developers. But there are differences between housing associations and other developers. This is mostly reflected in their valuation of projects (Hoomans, 2019).

Therefore this research proposal will focus on the differences in values between nonprofit organisations and for profit organisations and how they compare. This research proposal will propose a qualitative research method. The instruments in this research used are interviews and focus group discussions. The interviews are used to create an understanding of both the assessment process and the prioritisation of different values regarding transformation projects. While focus group discussion with a heterogeneous group will set the values of the housing associations in regards to transformations.

Thus making it possible to create a valuation tool for housing associations when considering a transformation project. This would in turn possibly increase the amount of transformations by housing associations, but also give housing associations a better grip on what transformations entail so that they can make a balanced decision.

ID: 179262

Start date: 11-06-2025

End date: 07-11-2025

Last modified: 30-05-2025

Master thesis MBE transforming buildings into housing for housing associations in the Netherlands with interviews and expert panel

0. Administrative questions

1. Provide the name of the data management support staff consulted during the preparation of this plan and the date of consultation. Please also mention if you consulted any other support staff.

Janine, Strandberg, Data Steward at the Faculty of Architecture and the Built Environment, has

2. Is TU Delft the lead institution for this project?

Yes, the only institution involved

I. Data/code description and collection or re-use

3. Provide a general description of the types of data/code you will be working with, including any re-used data/code.

Type of data/code	File format(s)	How will data/code be collected/generated? <i>For re-used data/code: what are the sources and terms of use?</i>	Purpose of processing	Storage location	Who will have access to the data/code?
Anonymised transcripts of the semi structured interviews	.mp3	Case study	to understand the scope of the case study and the underlying decision making process	TU Delft One Drive	Peter Pápai, Gerard van Bortel & Hilde Remøy
Documentation of projects containing: assessment tools & investment proposals	PDF .xlsx	Case study	to understand the scope of the case study and the underlying decision making process	TU Delft One Drive	Peter Pápai, Gerard van Bortel & Hilde Remøy
Anonymised transcriptions of the focus group discussions	.mp3	focus group discussion/expert panel	validating earlier findings, to capture the experts opinion regarding decision making and their experiences and attitudes regarding transformations into housing	External recording device (temporary storage) + TU Delft (primary storage)	Peter Pápai, Gerard van Bortel & Hilde Remøy

II. Storage and backup during the research process

4. How much data/code storage will you require during the project lifetime?

- < 250 GB

5. Where will the data/code be stored and backed-up during the project lifetime? (Select all that apply.)

- TU Delft OneDrive

III. Data/code documentation

6. What documentation will accompany data/code? (Select all that apply.)

- Data – Methodology of data collection
- Metadata – I will adhere to the metadata standards used by the data repository where the data will be shared (see section V)

IV. Legal and ethical requirements, code of conducts

7. Does your research involve human subjects or third-party datasets collected from human participants?

If you are working with a human subject(s), you will need to obtain the HREC approval for your research project.

- Yes – please provide details in the additional information box below

I intend to apply for ethical approval from the Human Research Ethics Committee, but have not yet done so.

8. Will you work with personal data? (This is information about an identified or identifiable natural person, either for research or project administration purposes.)

- Yes

Participants may be connected to the research because they can be connected to the case studies with which they are affiliated with.

9. Will you work with any other types of confidential or classified data or code as listed below? (Select all that apply and provide additional details below.)

If you are not sure which option to select, ask your [Faculty Data Steward](#) for advice.

- Yes, data which could lead to reputation/brand damage (for example, animal research, climate change)
- Yes, confidential data received from commercial, or other external partners

10. How will ownership of the data and intellectual property rights to the data be managed?

For projects involving commercially-sensitive research or research involving third parties, seek advice of your [Faculty Contract Manager](#) when answering this question.

This is an internal TUD MSc thesis project.

11. Which personal data or data from human participants do you work with? (Select all that apply.)

- Other types of personal data or other data from human participants – please provide details below
- Proof of consent (such as signed consent materials which contain name and signature)
- Audio recordings
- Telephone number, email addresses and/or other addresses as contact details for administrative purposes
- Names as contact details for administrative purposes

Because of the nature of semi structured interviews it is possible that participants will share personal information unintentionally during 'free text fields' during the interview.

12. Please list the categories of data subjects and their geographical location.

The interview participants are professionals in the domain of transforming existing real estate into housing. All participants are located in the Netherlands.

The participants of the focus group are professionals in the domain of transforming existing real estate into housing. All participants are located in the Netherlands.

13. Will you be receiving personal data from or transferring personal data to third parties (groups of individuals or organisations)?

- No

16. What are the legal grounds for personal data processing?

- Informed consent

17. Please describe the informed consent procedure you will follow below.

The researcher will inform the potential participants about the goals and procedures of the research project. The researcher will also inform them about the personal data that are being processed and for what purpose. This information will be provided to the potential participants by providing a digital copy of the information will be emailed to the participants before the interview and/or focus group discussion.

All participants will be asked for their consent for taking part in the study and for data processing by signing a digital informed consent form before the start of the interview and the focus group discussion.

18. Where will you store the physical/digital signed consent forms or other types of proof of consent (such as recording of verbal consent)?

Same storage solutions as explained in question 5

19. Does the processing of the personal data result in a high risk to the data subjects? (Select all that apply.)

If the processing of the personal data results in a high risk to the data subjects, it is required to perform a [Data Protection Impact Assessment \(DPIA\)](#). In order to determine if there is a high risk for the data subjects, please check if any of the options below that are applicable to the processing of the personal data in your research project.

- ☒ None of the above apply

23. What will happen with the personal data used in the research after the end of the research project?

- ☒ Anonymised or aggregated data will be shared with others

24. For how long will personal research data (including pseudonymised data) be stored?

- Personal data will be deleted at the end of the research project
- 10 years, in accordance with the TU Delft Research Data Framework Policy

25. How will your study participants be asked for their consent for data sharing?

- In the informed consent form: participants are informed that their personal data will be anonymised and that the anonymised dataset is shared publicly

V. Data sharing and long term preservation

27. Apart from personal data mentioned in question 23, will any other data be publicly shared?

Please provide a list of data/code you are going to share under 'Additional Information'.

- No other data/code can be publicly shared – please explain below why data/code cannot be publicly shared

The documentation that the researcher may receive regarding the case studies will be highly sensitive information of the case studies. These may not be shared with the public as it may harm the image/position of the participants and/or affiliated organisations.

VI. Data management responsibilities and resources

33. If you leave TU Delft (or are unavailable), who is going to be responsible for the data/code resulting from this project?

My supervisor Gerard, van Bortel, tutor, Architecture/Management in the build environment/ Real estate management, with email address g.a.vanbortel@tudelft.nl.

34. What resources (for example financial and time) will be dedicated to data management and ensuring that data will be FAIR (Findable, Accessible, Interoperable, Re-usable)?

4TU.ResearchData is able to archive 1TB of data/code per researcher per year free of charge for all TU Delft researchers. We do not expect to exceed this and therefore there are no additional costs of long term preservation.

35. Which faculty do you belong to?

- Faculty of Architecture and the Built Environment (ABE)

Appendix 3. Consent form interviews

You are being invited to participate in a research study titled: *Finding the balance; Transformations for housing associations in the Netherlands* . This study is being done by Péter János Pápai from the TU Delft for the Master thesis of the master program Management of the Built Environment.

The purpose of this research study is to come up with a concept to standardise a valuation method of transformation of buildings into housing for housing associations in the Netherlands, and will take you approximately 60 minutes to complete. The data will be used for research publication. We will be asked to discuss the importance of different values in the realisation of transformation projects and how to find a balance between these values.

As with any collection of data the risk of a breach is always possible. To the best of our ability your answers in this study will remain confidential. We will minimize any risks by translating the recordings of the focus group discussion into anonymous transcripts and eliminating any personal information from documents that are filled in by hand during the discussion. Audio recordings will be deleted and handwritten documents are destroyed after anonymization. Data that is collected will be stored anonymously on the secured TU Delft project storage.

Your participation in this study is entirely voluntary **and you can withdraw at any time**. You are free to omit any questions. Submitted data can be removed within 40 days, if requested by the participant or legal representative of the participant.

In case of questions or comments, you can contact the researcher:

Péter Pápai
ppapai@tudelft.nl

PLEASE TICK THE APPROPRIATE BOXES	Yes	No
A: GENERAL AGREEMENT – RESEARCH GOALS, PARTICIPANT TASKS AND VOLUNTARY PARTICIPATION		
1. I have read and understood the study information dated 04/06/2025, or it has been read to me. I have been able to ask questions about the study and my questions have been answered to my satisfaction.	☐	☐
2. I consent voluntarily to be a participant in this study and understand that I can refuse to answer questions and I can withdraw from the study at any time, without having to give a reason.	☐	☐
3. I understand that taking part in the study involves: An interview being audio-recorded. The recordings will be transferred into an anonymized transcript that will be used for publication. Any possible personal data on those cards will be made unrecognisable	☐	☐
4. I understand that the study will end after the research is published	☐	☐
B: POTENTIAL RISKS OF PARTICIPATING (INCLUDING DATA PROTECTION)		
5. I understand that taking part in the study involves the following risk of mental discomfort.	☐	☐
6. I understand that taking part in the study also involves collecting specific personally identifiable information (PII): name, position with my respective field and affiliated housing; and associated personally identifiable research data (PIRD): quotes from the transcripts with the potential risk of my identity being revealed.	☐	☐
7. I understand that the following steps will be taken to minimise the threat of a data breach, and protect my identity in the event of such a breach by secure data storage and anonymization of the transcripts of the discussions.	☐	☐
8. I understand that personal information collected about me that can identify me, such as my name, gender and position that will not be shared beyond the study team.	☐	☐
9. I understand that the (identifiable) personal data I provide will be destroyed after the research has been published	☐	☐
C: RESEARCH PUBLICATION, DISSEMINATION AND APPLICATION		
10. I understand that after the research study the de-identified information I provide will be used for publications and the use of quotations within those publications.	☐	☐
11. I agree that my responses, views or other input can be quoted anonymously in research outputs	☐	☐
12. I agree that my real name can be used for quotes in research outputs	☐	☐
D: (LONGTERM) DATA STORAGE, ACCESS AND REUSE		

PLEASE TICK THE APPROPRIATE BOXES	Yes	No
13. I give permission for the de-identified transcript that I provide to be archived in TU.ResearchData repository so it can be used for future research and learning.	☐	☐
14. I understand that access to this repository is restricted and may only be used when credited under the same licence. The data in the repository will be deleted after 10 years.	☐	☐

Signatures

Name of participant [printed]

Signature

Date

I, as researcher, have accurately read out the information sheet to the potential participant and, to the best of my ability, ensured that the participant understands to what they are freely consenting.

Researcher name [printed]

Signature

Date

Study contact details for further information:

Péter Pápai

ppapai@tudelft.nl

Appendix 4. Consent form expert panel

You are being invited to participate in a research study titled: *Finding the balance; Transformations for housing associations in the Netherlands* . This study is being done by Péter János Pápai from the TU Delft for the Master thesis of the master program Management of the Built Environment.

The purpose of this research study is to come up with a concept to standardise a valuation method of transformation of buildings into housing for housing associations in the Netherlands, and will take you approximately 120 minutes to complete. The data will be used for research publication. We will be asked to discuss the importance of different values in the realisation of transformation projects and how to find a balance between these values.

As with any collection of data the risk of a breach is always possible. To the best of our ability your answers in this study will remain confidential. We will minimize any risks by translating the recordings of the focus group discussion into anonymous transcripts and eliminating any personal information from documents that are filled in by hand during the discussion. Audio recordings will be deleted and handwritten documents are destroyed after anonymization. Data that is collected will be stored anonymously on the secured TU Delft project storage.

Your participation in this study is entirely voluntary **and you can withdraw at any time**. You are free to omit any questions. Submitted data can be removed within 40 days, if requested by the participant or legal representative of the participant.

In case of questions or comments, you can contact the researcher:

Péter Pápai
ppapai@tudelft.nl

PLEASE TICK THE APPROPRIATE BOXES	Yes	No
A: GENERAL AGREEMENT – RESEARCH GOALS, PARTICIPANT TASKS AND VOLUNTARY PARTICIPATION		
1. I have read and understood the study information dated 04/06/2025, or it has been read to me. I have been able to ask questions about the study and my questions have been answered to my satisfaction.	☐	☐
2. I consent voluntarily to be a participant in this study and understand that I can refuse to answer questions and I can withdraw from the study at any time, without having to give a reason.	☐	☐
3. I understand that taking part in the study involves: An expert panel that is being audio-recorded. The recordings will be transferred into an anonymized transcript that will be used for publication. Any possible personal data on those cards will be made unrecognisable	☐	☐
4. I understand that the study will end after the research is published	☐	☐
B: POTENTIAL RISKS OF PARTICIPATING (INCLUDING DATA PROTECTION)		
5. I understand that taking part in the study involves the following risk of mental discomfort.	☐	☐
6. I understand that taking part in the study also involves collecting specific personally identifiable information (PII): name, position with my respective field and affiliated housing; and associated personally identifiable research data (PIRD): quotes from the transcripts with the potential risk of my identity being revealed.	☐	☐
7. I understand that the following steps will be taken to minimise the threat of a data breach, and protect my identity in the event of such a breach by secure data storage and anonymization of the transcripts of the discussions.	☐	☐
8. I understand that personal information collected about me that can identify me, such as my name, gender and position that will not be shared beyond the study team.	☐	☐
9. I understand that the (identifiable) personal data I provide will be destroyed after the research has been published	☐	☐
C: RESEARCH PUBLICATION, DISSEMINATION AND APPLICATION		
10. I understand that after the research study the de-identified information I provide will be used for publications and the use of quotations within those publications.	☐	☐
11. I agree that my responses, views or other input can be quoted anonymously in research outputs	☐	☐
12. I agree that my real name can be used for quotes in research outputs	☐	☐
D: (LONGTERM) DATA STORAGE, ACCESS AND REUSE		

PLEASE TICK THE APPROPRIATE BOXES	Yes	No
13. I give permission for the de-identified transcript that I provide to be archived in TU.ResearchData repository so it can be used for future research and learning.	☐	☐
14. I understand that access to this repository is restricted and may only be used when credited under the same licence. The data in the repository will be deleted after 10 years.	☐	☐

Signatures

Name of participant [printed]

Signature

Date

I, as researcher, have accurately read out the information sheet to the potential participant and, to the best of my ability, ensured that the participant understands to what they are freely consenting.

Researcher name [printed]

Signature

Date

Study contact details for further information:

Péter Pápai

ppapai@tudelft.nl

Appendix 5. Topics interviews

Topics interviews based on the indicators as seen in table 3 of the thesis

People

- Heritage: How does the project conserve/strengthen social significance?
(Social/historic/scientific/aesthetic)
- Future user: How does the project fit the target group on the following indicators?
 - o Accessibility
 - o Affordability
 - o Use-value
- Neighbourhood: How does this project fit in the neighbourhood on the following indicators?
 - o Diversity
 - o Community
 - o Supportiveness

Planet

- Circularity: Was circularity within this project?
 - o Waste
 - o CO2 emission
- Energy consumption: What is more important, energy usage or energy label?
 - o Energy transition
- Ecological: What is the ecological value of the project?
 - o Added green
 - o Added nesting places
 - o Nitrogen emissions

Profit

- Investment: How do the investment costs differ from newly built development?
 - o Building costs
 - o Ground costs
- IRR & RISK: How is risk measured?
 - o IRR
 - o NPV
- Market value: What is a desired LTV ratio?
 - o LTV
 - o Market value