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Transformation Meter for Offices

A tool to assess opportunities and risks of Adaptive Reuse

Rob Geraedts [1951-2023], Theo van der Voordt and Lizanne Espinal

Rob Geraedts passed away in October 2023. We are honoured to dedicate this chapter posthumously to Rob.

How can an owner, potential buyer, developer, or investor know if a vacant office building is suitable for conversion to housing and to what extent this is functionally, technically, and financially feasible? This is an important question, especially in a time of high vacancy rates and a strong demand for housing. This chapter discusses the so-called transformation meter, also called a conversion potential assessment tool: a checklist that helps determine which characteristics of the market, location, building, and involved parties are favourable or unfavourable for a successful transformation, potential risks, and how these risks can be mitigated. The transformation meter is phased from a "quick and dirty" general assessment to a more detailed analysis. Additionally, the role of this tool in the decision-making process regarding a go/no-go decision—whether to proceed with further planning or to stop investigating feasibility—is discussed. The chapter concludes with a brief discussion of other tools available for assessing the opportunities, obstacles, and risks associated with repurposing buildings.

11.1

Adaptive reuse Potential from Office to Residential Use

For experienced professionals, an initial exploration of a vacant or soon-to-be-vacant office building can relatively quickly provide insight into the possibilities and barriers for repurposing it into residential use or a combination of residential and other functions. According to experts from the industry, the likelihood of a successful conversion to residential functions mainly depends on three factors:

1 **Duration of Vacancy:** The longer an office building remains vacant, the more likely the current owner is willing to either sell the property or pursue repurposing it themselves.

2 **Cause of Vacancy:** Market, Location, and/or Building. If a building is vacant due to a temporary downturn in the office market (more supply than demand), repurposing may not be the best option. When the office market rebounds, continuing to use the building as office space might be more profitable. However, in cases of structural vacancy and a tight housing market (more demand than supply), repurposing the building into residential units could be a viable option. This decision depends on the suitability of the location for residential use and the building's potential to be transformed into an attractive residential space for specific target groups. Financial feasibility is also a critical success factor.

3 **Municipal Policy:** If the building is designated for office use, cooperation with and support from the municipality is necessary to change the designation (see Fred Hobma's chapter on the Dutch Environment and Planning Act: '3. Legal Framework'). If the vacant office building is located in an area where the municipality prioritises housing, repurposing it into residential units is promising, as it aligns with municipal interests. Buildings located in a (re)development zone designated for office use are more likely to be renovated and reused as office buildings rather than converted into residential spaces.

These factors clearly indicate what a property owner or potential buyer (typically a commercial developer or housing corporation, and occasionally a residents' collective) should first consider when considering the repurposing of a vacant office building into residential units. Important considerations include: What is the state of the local office and housing markets? How long has the building been vacant? Is there demand for housing, and in what categories (target groups, price levels)? Where is the building located, and how favourable is the location for housing development? What does the building itself allow, and where might there be potential bottlenecks? How does the municipality view repurposing, and are they willing to amend the current designation if necessary?

For a preliminary scan of the location and the building, developers often apply their own veto criteria, such as proximity to amenities, the building's year of construction, energy label, a favourable structural grid for accommodating residential units, sufficient depth to ensure adequate daylight in the residences, financial viability, and minimal complications. Based on this initial assessment, a decision is typically made to either proceed with further planning for repurposing (go) or to abandon the project (no-go). This evaluation often also considers the option of demolition and new construction as an alternative.

A decision to proceed with repurposing (a go) requires a further exploration of opportunities and risks, the creation of a plan, and a more detailed mapping of costs and revenues.

11.2

Office Transformation Meter

To efficiently and systematically determine whether a vacant office building has sufficient potential to be converted into housing, the so-called transformation potential meter, in the Netherlands known as the "office transformation meter," was developed. Elsewhere this meter is called a conversion potential assessment tool (Geraedts et al., 2018). Using various checklists, this tool allows for the assessment of which characteristics of the location and building are favourable or unfavourable for successful transformation. The instrument can assist involved stakeholders in making informed decisions and in checking during the planning process whether they are still on the right track. The first version of the transformation meter dates back to the late 1990s, and it has since undergone several updates, as noted in the accompanying text box.

Development of the Transformation Meter

The development of the transformation meter dates back to the late 1990s, a time when there was a record number of vacant office buildings (Geraedts et al., 1999). The Transformation Meter 1.0 was primarily based on literature review (Geraedts & Van der Voordt, 2002-2003). With input from practical applications and its use in numerous graduate studies at the Faculty of Architecture at TU Delft, the transformation meter was further refined. During interviews with parties involved in various repurposing projects, questions were asked about which aspects they considered important at both the location and building levels for a successful transformation. Additionally, research findings related to housing preferences in relation to location and building characteristics were utilised.
In 2007, two new steps were added: a scan for financial feasibility and a checklist how to cope with risks (Geraedts & Van der Voordt, 2007). In 2012, the Dutch Building Decree (‘Bouwbesluit’) was amended. An update to the transformation meter was published in 2018, incorporating these changes and adjusting the description of criteria so that a positive score would contribute to the likelihood of success (Geraedts et al., 2018). The Dutch Environment and Planning Act (Dutch: Omgevingswet), includes the technical requirements from the Building Decree in the new "Bouwbesluit bouwwerken leefomgeving" (Bbl), which was published in October 2023 (www.wetten.overheid.nl; https://www.bblonline.nl/docs/wet/bbl). For existing buildings constructed before January 1, 2024, the 2012 Building Decree remains applicable to assess whether the building meets the permit requirements of its construction year. In the latest version of the transformation meter (discussed in this chapter), these updates have been incorporated. Additionally, financial feasibility has been prioritised in the assessment of adaptive reuse potential, cost data has been updated, criteria now also include the maximum distance to stairs and elevators, and more detailed information has been added regarding the maximum desired distance to various amenities.

Five steps

The transformation meter consists of five steps, with Step 0 being the preliminary task of identifying vacant office buildings. Step 1 is a quick scan based on a limited number of veto criteria, divided into the aspects of Market, Location, Building, and Organisation. If a building does not meet these criteria, it is eliminated as a potential candidate for transformation and adaptive reuse, resulting in a no-go decision. Step 2 involves a quick scan of financial feasibility. If this criterion is not met, the repurposing is also ruled out, unless there are societal reasons that outweigh a negative or insufficient financial outcome. Step 3 is a more detailed feasibility scan. Gradual criteria for the location and the building are assessed to determine which characteristics are favourable or unfavourable for transformation and repurposing. Step 4 expresses these findings in an overall score, indicating whether a building is hardly transformable or highly transformable. Depending on this outcome, a decision is made between a go or no-go. Step 5 consists of a Risk Inventory Checklist and suggestions to reduce these risks.

The sequence of steps can vary depending on the project. Although it makes sense to start with a quick assessment of veto criteria, evaluating gradual criteria and risks, as well as exploring ways to meet certain criteria and mitigate or reduce risks, can significantly influence financial feasibility. Table 11.1 provides a summary of the five steps. The following sections will discuss each step in detail.

TABLE 11.1 The steps of the transformation meter

STEP	ACTION	LEVEL	RESULT
Step 0	Inventory of vacant offices	Building stock / office market	Insight into which office buildings are vacant and their locations
Step 1	Quick scan: Evaluation of adaptive reuse potential based on veto criteria	Location Building	Rapid selection of offices; suitable/not suitable for further investigation > go/no-go
Step 2	Quick scan: Exploration of financial feasibility	Building	Insight into financial feasibility; Cost-benefit analysis > go/no-go
Step 3	Evaluation of location and building based on gradual criteria	Location Building	Judgment on the adaptive reuse potential of the office building > go/no-go
Step 4	Determination of transformation class	Location Building	Transformation class of the office building > go/no-go
Step 5	Risk Inventory Checklist	Location Building	Risks and opportunities to reduce risks > go/no-go

Step 0: Inventory of supply and demand at the area Level

The real estate market's demand for residential space and the availability of vacant office buildings are crucial factors in the likelihood of successfully repurposing offices into residential units.

General data on Dutch office vacancy rates, both nationally and at regional or urban levels, can be found in sources such as the National Vacancy Monitor from Statistics Netherlands (CBS) and various reports, such as NVM Business 2022. At the local level, it's important to understand which office buildings within a municipality or specific area are (structurally) vacant or are expected to become vacant soon, and to know the demand for different types of housing. Key sources include the municipality, real estate agents, industry literature, and personal observations.

Repurposing empty office buildings into dwellings only makes sense when these dwellings meet a need. The supply (empty office building) must match the demand (for dwellings), both quantitatively and qualitatively, in terms of location, living environment, and characteristics of the dwellings after repurposing. For data on the Dutch housing market, see resources like the site of Housing Research Netherlands, abbreviated as WoON (www.woon-onderzoek.nl/). Knowledge of the local housing market and the wishes and preferences of potential target groups is necessary as well. Based on various housing studies, Table 11.2 shows which aspects are important to many people when choosing a home.

TABLE 11.2 Relevant Aspects on the Demand Side (Geraedts & Van der Voordt 2007

LOCATION (HOUSING ENVIRONMENT)	BUILDING (HOUSING)
1. REPRESENTATIVES	**1.** DWELLING TYPE
a Characteristics of Surrounding Buildings	**2.** ACCESS
b Social image	**3.** DWELLING SIZE
c Vibrancy	**a** Number of Rooms
d Green character	**b** Living Room
2. FACILITIES	**c** Kitchen
a Shops	**d** Bedrooms
b Hospitality industry	**e** Sanitary space
c Schools	**f** Storage space
d Bank/post office	**4.** SPATIAL LAYOUT OF THE DWELLING
e Medical services	**5.** EQUIPMENT
f Leisure facilities	**6.** OUTDOOR SPACE
3. ACCESSIBILITY TO PUBLIC TRANSPORT	**7.** OUTSIIDE AND INSIDE VIEW
a Distance to Bus Stop	**8.** ENVIRONMENTAL ASPECTS
b Frequency and Time schedule	**a** Heating
c Distance to Tram or Metro	**b** Ventilation
d Frequency and Time schedule	**c** Noise and acoustics
e Distance to Train Station	**d** Sunlight and daylight
f Frequency and Time schedule	**e** Energy consumption
4. ACCESSIBILITY BY CAR	**f** Use materials
a Distance to Highway	**9.** GENERAL CONDITIONS
b Traffic Flow	**a** Accessibility
c Parking Availability	**b** Safety
	c Adaptability
	d Adequate management
	10. COSTS
	a Purchase price/rent level
	b Additional costs

Differences Between Target Groups

An attractive and safe living environment, type of housing, housing size (size of the living room, number of rooms), the ratio between price and quality, affordability, and rental or purchase options are important factors for all target groups. Accessibility by public transport, parking availability, and proximity to shops are also high on many people's wish lists. Criteria and prioritisation mainly focus on price and quality level, preference for a single-family home versus an apartment, and living in an urban environment with many amenities versus a quiet residential area with lots of greenery. Preferences are especially dependent on age, life stage, household composition, and financial capacity. For students and starters, repurposing into relatively small and inexpensive homes can be a suitable choice. When it comes to high-rise office buildings, adaptive reuse into residences for households with young children is less suitable. Converting them into apartments for seniors may be a better option. Based on differences in housing desires and preferences, five demand profiles have been compiled, see Table 11.3.

Redevelopment of vacant office buildings into housing is only worthwhile when it meets a need.

TABLE 11.3 Five demand profiles for urban redevelopment projects

TARGET GROUP 1: STARTERS	**TARGET GROUP 2: STARTERS**	**TARGET GROUP 3: YOUNG DUAL-INCOME HOUSEHOLDS**
Young, low-income single persons /Group living	Young, low-income single persons /Semi-independent living	Young couples with dual incomes / semi-independent living
LOCATION (LIVING ENVIRONMENT)	LOCATION (LIVING ENVIRONMENT)	LOCATION (LIVING ENVIRONMENT)
1. Urban environment, rich in amenities	1. Urban environment, rich in amenities	1. Urban environment, rich in amenities 2. Suburban residential environment (space, greenery) 3. Easily accessible by car 4. Appropriate parking facilities
BUILDING (DWELLING)	BUILDING (DWELLING)	BUILDING (DWELLING)
2. Unit in a group of 3-7 residents 3. Living/bedroom approximately 22 m ² 4. Shared sanitary facilities; 1 shower/toilet per 4 units 5. Shared kitchen 6. Shared outdoor space 1.5 m²/unit 7. Shared bicycle storage 8. Shared laundry room 9. Total 50 m²; usable area 35 m²	2. Semi-independent unit with communal facilities 3. Living/bedroom approximately 22 m² 4. Sanitary facilities per 2 residents 5. Kitchen per 2 residents 6. Shared outdoor space 1.5 m²/unit 7. Shared bicycle storage 8. Shared laundry room 9. Total 50 m²; usable area 35 m²	5. Large luxury apartment 6. Private outdoor space

TARGET GROUP 4: SENIORS 55+	**TARGET GROUP 5: SENIORS 55+**
Low to average income	Above average income
LOCATION (LIVING ENVIRONMENT)	LOCATION (LIVING ENVIRONMENT)
1. Safe living environment 2. Daily shops and public transport within walking distance (< 500 m) 3. Preference for an urban environment 4. Goede parkeervoorzieningen 4. Suburban residential environment (space, greenery)	1. Safe living environment 2. Shops, greenery, bank, post office, and public transport within walking distance (< 500 m) 3. Easily accessible by car 4. Appropriate parking facilities 5. Partly urban, partly suburban environment
BUILDING (DWELLING)	BUILDING (DWELLING)
5. Preferably no ground-floor dwelling 6. Presence of an elevator 7. Preferably no internal stairs 8. At least a 3-room apartment 9. Living room 25-30 m²; bedroom > 11.5 m² 10. Direct connection between living room, main bedroom, and bathroom 11. Extra attention to sound insulation 12. Adaptable in case of physical impairments	6. Preferably no ground-floor dwelling 7. Presence of an elevator 8. Preferably no internal stairs 9. Porch entrance; preferably no gallery entrance 10. 4/5-room apartment 11. Living room 30-40 m²; large kitchen 12. Direct connection between living room, main bedroom, and bathroom 13. Spacious bathroom 14. Balcony or rooftop terrace 10-15 m² 15. Extra attention to sound insulation 16. Adaptable in case of physical impairments

Comparison of Demand and Supply

In terms of location, demand and supply can be compared relatively easily. The location of an empty office building can be assessed based on the presence of nearby amenities, distance to public transport, vibrancy, and social safety. However, comparing supply and demand at the building level is more complex. Some characteristics of an empty building (supply) primarily represent conditions that make the adaptive reuse to certain types of housing either straightforward or difficult and costly. For instance, this applies to the load-bearing structure and installations. These features do not directly appear in a demand profile for residents.

The extent to which the supply meets current housing desires and preferences can only be determined once a preliminary adaptive reuse plan has been developed. This is also necessary to estimate how many housing units can be accommodated, depending on the types and sizes of the dwellings.

Step 1: Quick scan based on veto criteria

Step 1 involves a preliminary, rapid, and relatively low-effort scan of an empty office building using nine veto criteria, divided into four aspects: Market, Location, Building, and Organisation/Actors (see Table 11.4). A veto criterion means that if the criterion is not met (Judgment 'No'), the adaptive reuse to residential use is almost impossible. Further detailed research (Steps 2-5) is then unnecessary. In the process of surveying empty offices in a municipality or specific area, this quick scan allows for a swift selection of potentially interesting properties. When redeveloping a specific vacant office building, it also quickly becomes clear whether adaptive reuse is feasible. Depending on the context, the user can add or remove veto criteria.

The veto criteria apply to every target group. Veto criterion 1 is self-explanatory. Veto criteria 2 and 3 pertain to the building's location. If the municipality does not permit a change in the purpose of an office building or if the building is situated in an industrial area with serious health risks, further investigation into transforming it into residential use is of little value. Veto criterion 4 concerns the minimum ceiling height, which is currently set at 2.10 meters (requirement for existing buildings). In practice, a minimum height of 2.60 meters is often required for habitable spaces. Veto criteria 5-9 (organisation) relate to the most directly involved stakeholders. An enthusiastic initiator is essential for feasibility. This could be a developer, the municipality, a housing corporation, or an enthusiastic group of residents. In practice, these stakeholders might overlap, for example, if a municipality owns the building and wants to redevelop it itself.

In the column 'Source,' the method for obtaining the necessary information is indicated. The final column records whether the criterion is applicable or not. If one or more veto criteria are not met, the vacant office building is generally ruled out for conversion to residential use, unless the criterion is 'correctable.' For instance, this could be achieved by negotiating with the municipality for more flexible handling of the zoning plan.

TABLE 11.4 Quickscan based on veto criteria

ASPECT	VETO CRITERION	SOURCE	ASSESS-MENT	
MARKET			YES	NO
1. Demand for housing	1. Demand for housing for local target groups	Municipality or real estate agent		
LOCATION				
1. Urban environment	2. Zoning plan change permit	Environment & Planning Act; municipal policy		
	3. No health risks from odor, noise, pollution	Observation on-site; real estate agent		
BUILDING				
2. Dimension of the shell	4. Free ceiling height > 2,60 m	Observation on-site; building plans		
ORGANISATON/ACTORS				
3. Initiator	5. Presence of enthusiastic initiator with influence	Local research		
4. Developer / investor	6. Meets the requirements regarding location and accessibility	Developer		
5. Owner	7. Meets the requirements regarding the size and character of the building	Developer		
6. Municipality	8. Willingness to sell the building	Owner		
	9. Positive attitude towards conversion	Municipality		
		Result quickscan		

Step 2: Quick scan of financial feasibility by means of key figures

If repurposing is not financially feasible, further development of the plan doesn't make sense. For an initial exploration of the financial feasibility of repurposing projects, key figures are used in step 3. It appears to be difficult to find reliable current key figures. Developers, contractors and architectural firms that frequently conduct repurposing projects and can compare projects with each other do have key figures, but they are not publicly accessible.Interesting Dutch sources with key figures include:

- project analysis, e.g. by Gelinck & Strolenberg (2014);
- data on building costs (https://www.bouwkosten.nl; https://www.bouwkostenkompas.nl/en)
- Vastgoeddata (https://www.vastgoeddata.nl); ;
- the pdok dataset with current geo-information https://www.pdok.nl);
- data on WOZ-values (property values) (https://www.wozwaardeloket.nl);
- CBS statistics on purchase and rental prices of homes (http://www.opendata.cbs.nl/statline);
- BDB index figures http://www.bdb.nl) that provide insight into cost developments of wages, materials, and equipment, with a distinction between cost price development without market effects (structural figures) and including market effects (cyclical figures).

Costs

The market value or acquisition costs of an empty office building depend on several factors: the book value of the building, the owner's willingness to depreciate the value if necessary and within fiscal-legal limits, the duration of vacancy, location and building characteristics, and the negotiation space between the owner and a potential buyer. Renovation costs depend on the building's maintenance condition, the level of interventions required, the extent to which the building needs to be renovated or expanded, the grid size and placement of (structural) walls (due to the possibilities for integrating residential units), and whether additional amenities such as outdoor space or a parking garage have to be added (Mackay et al. 2009; Remøy & Van der Voordt 2014). Major cost generators include demolition costs, facade adjustments or replacements, interior walls, piping and installations, acoustic measures, and finishing levels. Fitting many small units is generally more expensive than larger units due to the large number of kitchens, sanitary facilities, and piping. Asbestos removal is also costly. Adding additional floors is expensive but can be highly profitable.

In a study on the repurposing of offices into care housing, six intervention levels were identified (Remøy & Van der Voordt 2011), ranging from simple basic measures to make a building ready for new functions (cleaning, painting, wallpapering) and a light renovation, to extensive modifications and complete stripping plus new installations. The costs vary accordingly. The level of intervention must be determined for each function. Key questions include: What quality level is being pursued? Which building components and materials can be reused? What exactly needs to be demolished and replaced?

Due to the large number of influencing factors, the range of acquisition and renovation costs is quite broad. In a conversation with an experienced project developer, a price of around €500 per square meter of gross floor area (GFA) was mentioned for the purchase price, which can rise to €1,500 per square meter of GFA in prime locations and may be lower in peripheral municipalities, with a lower limit of €250 per square meter of GFA. In the same conversation, a range of €1,500 to €2,500 per square meter of gross floor area was mentioned for construction costs.

In the 58 documented projects from an earlier version of this book (Van der Voordt et al. 2007), all of them from the Netherlands, the purchase price ranged from zero (when the building remains in ownership or is rented) and a symbolic transfer price of €1 for a vacant church, to over €800 per square meter. Renovation costs ranged from €212 to €1,900 per square meter. The ratio of acquisition costs to renovation costs varied correspondingly, from 0.02 to 2.20, with an average of 0.49. This means that renovation costs are on average about twice as high as acquisition costs.

In the 26 Dutch projects investigated by Gelinck and Strolenberg (2014), investments ranged from a few tens of euros per square meter to €2,400 per square meter of rentable floor space. In nearly half of these projects, less than €1,000 per square meter was invested, and in some adaptive reuse projects, even less than €500 was spent (not up to new construction quality). The most expensive projects were historic buildings where restoration was also carried out. The analysed projects are respectively more than seventeen and ten years old. Therefore, the figures are outdated but provide an idea of the practical range.

Revenues

Aan de opbrengstenkant is bepalend hoeveel woningen van een bepaald type en prijsOn the revenue side, it is crucial to determine how many homes of a particular type and price level can be created for which target groups. This primarily depends on the building's capacity and the grid size of the supporting structure. To estimate the number of possible residential units, a preliminary design is often used, based on the existing floor plans.

Dutch housing selling prices (2024) Selling prices and revenues from rent depend on the location, dwelling type, size of the dwelling, spatial layout, housing quality, and available facilities like (private) parking facilities. Nowadays sustainability, energy label, and monthly energy costs are important as well. Selling prices have immensely increased in the last decade. The current average selling price of Dutch houses range from around € 2,000 per m2 in the upper north part of the Netherlands till € 7,187 per m2 in Amsterdam. The average selling price is about € 460.000 per dwelling.

Dutch housing rent prices (2024) Rent prices show large bandwidths as well. For instance, the price of student rooms varies from about € 375 – over € 700, with an average of about € 420 euro. The average rent level per square meter is about € 21/ m2. The maximum price for a student room depends on the scarcity in a particular city. Amsterdam is the most expensive city, with an average room price of € 961. € 493 per month is paid for a room of 15m² on average, which is €36 per m² per month. The second most expensive city is Utrecht, with an average rent of €837. More affordable options can be found in Wageningen (€ 354), Enschede (€ 366) and Leeuwarden (€406).

A student room usually falls into the category of non-independent living space. This is a living space where one or more facilities in the home are shared with co-residents. There is a maximum amount of rent that may be charged for non-independent homes. This maximum can be calculated using the Rent Assessment Committee's points system. For instance, a room of 15m², with a shared kitchen, toilet, bathroom, outdoor area and bicycle shed may cost a maximum of € 216 per month in basic rent according to the points system. Two rooms of 25m² in total, with their own kitchen and bathroom plus shared toilet and outdoor area may cost a maximum of € 380 per month in basic rent according to the points system. It is important that the ‘bare’ rent is separated from the service costs (gas, water, electricity, cleaning of circulation space).

The prices for a studio are a lot higher. On https://kamernet.nl/huren/studio-nederland 71 studios are presented for rent, with rental prices ranging from € 430 per month for a furnished studio of 30 m2 in Sittard, in a student house, to € 2,500 euros per month for a furnished studio of 32 m2 in Amsterdam, including fixed costs (energy and service costs), and a deposit of no less than € 5,000.

For independently occupied rental properties, rents in social and mid-range rental housing are regulated. There is a maximum amount of rent that may be charged according to the housing valuation system (Dutch: Woonwaarderingsstelsel, WWS), mentioned in the Dutch Residential Rental Prices Decision of the government. The number of housing valuation points determines the maximum allowable rent for social and mid-range rental housing. The number of WWS points largely depends on the surface area, but other factors also play a role, such as the degree of insulation of a home, location, and whether it is an existing or new home.

In addition, social rental housing is capped based on provisions in the Housing Act 2015, and in the mid-range rental segment in the Affordable Rent Act, which was introduced this year.

Table 11.5 provides an indication of potential rental yields for different types of housing (price level 1-1-2024). For social rental housing, the upper limit is 144 WWS points, with a maximum rent of € 879.66. For mid-range rent, the upper limit is 186 WWS points, with a maximum rent of € 1157.95. As shown, there is often no direct relationship between the surface area of a home and the maximum rent. The table does not contain an indication of rental prices in the private rental sector, because location is often decisive there. For properties in the private sector (rents above €1,100) and rental by a commercial entity, a Gross Initial Yield (GIY) of between 4% and 7% is typically used in the Netherlands. Currently, developers are working with a lower GIY, ranging from 3.5% to 5%.

TABLE 11.5 Indicative rent revenues for Different Housing Types (price level January 2024)

HOUSING TYPE	TARGET GROUP	Indicative Rent		Indicative Floor area
		Social rent Price level as of 1 January 2023	**Mid rent** Price level as of 1 January 2023	
Room	Students	< € 434[1]	n/a	15-25 m²
Studio	Studenten/Young People/People in Urgent Need/Status Holders	< € 434	n/a	25-35 m²
2-bedroom apartment	Single and Two-Person Households	€ 647,19[2] € 808,06[3]	€ 808,06 € 1.100	35-45 m²
3-bedroom apartment	Single and Two-Person Households/Young Families	€ 647,19 € 808,06	€ 808,06 € 1.100	45-75 m²
4-bedroom apartment	Two-Person Households/Families	€ 693,60[4] € 808,06	€ 808,06 € 1.100	75-95 m²

1 Quality Discount Threshold for Rent Allowance.
2 Capping Threshold for Rent Allowance for Single and Two-Person Households.
3 Liberalization Threshold/Social Rent Sector Boundary/Rent Allowance Threshold.
4 Capping Threshold for Rent Allowance for Three or More Person Households.

Residual Value Calculation

In practice, the residual value approach is widely used. This method involves:

1. Calculating the potential revenue from the new use (for residential properties: revenue from sale or rental).
2. Determining the costs for building modification.
3. Calculating the residual value, which is the revenue minus the renovation costs.

Once the purchase price and renovation costs are known, and the required return on investment is established, it becomes clear what the maximum investment budget is for purchasing a vacant property. This calculation can be carried out for various new functions to determine the so-called Highest and Best Use (HBU) after repurposing. Sometimes a negative outcome is accepted, for example, if the repurposing of a property is socially urgent or offers opportunities for profitable projects elsewhere. In such cases, the shortfall or unprofitable portion is usually covered by the general company reserve.

Financial feasibility can be improved by expanding the building, either horizontally or vertically, by adding extra floors, or by incorporating commercial functions, often in the building's base. For students and starters, it may be an option to share certain spaces and facilities or to carry out some of the work in-house by self-employment. Sometimes it is possible to make use of subsidies.

Input for an Investment and Exploitation Plan

Once a preliminary cost-benefit analysis has been conducted based on key figures and a preliminary design with different housing types and floor plan optimisation for the existing office building, this information can be used by the initiator or developer for decision-making. Developers mainly focus on the volume of the building, the number of residential units it can accommodate, and, in the case of partial vacancy, the current lease agreement, which they convert into net present value. One of the interviewed developers uses a rule of thumb that a capitalised rental value greater than €4,000/m² generally indicates a positive outcome.

For further decision-making, a more detailed investment budget and operating calculation are required, based on an element budget (often prepared by a cost specialist) and a cash flow calculation ('Discounted Cash Flow'). For various calculation methods, we refer to the chapter by Peter de Jong and Michaël Peeters on financial feasibility ('2. Financial Feasibility'). Additional requirements may be set regarding the profitability of a project. Often, consideration is given to an increase in land value during the operational period and the residual value in case of eventual disposal or demolition. This means that the office building is not depreciated to zero over the operational period, but a realistic residual value is determined. The residual value can be positively influenced by using flexible built-in packages, allowing the building to be adapted for other functions in the future.

Step 3: Feasibility Scan Based on Gradual Criteria

If all questions in the veto scan from Step 1 are answered with 'Yes', and the financial feasibility scan from Step 2 is positive as well, this indicates potential suitability for repurposing. In the next stage, a more detailed scan with gradual criteria can provide a more accurate picture of the opportunities and obstacles for repurposing. A gradual criterion means that the individual assessment of this criterion does not lead to an approval or rejection of a building for adaptive reuse; instead, all gradual criteria together provide a nuanced view of the repurposing potential of a building. Criteria are partially dependent on the context. It may happen that a gradual criterion is a veto criterion for certain parties, or conversely: a veto criterion is not decisive for a no-go. For example, some developers do not buy office buildings with an energy label lower than C (which has been mandatory for office buildings in the Netherlands since 2023). If repurposing proves unfeasible, the building might still be rented out as an office after some refurbishment. A monument is attractive for living, but monument status also entails complex and restrictive regulations. The weight of such criteria can vary by project and stakeholder.

Table 11.6 presents the gradual criteria for a feasibility scan of the location. The location scan consists of seven main criteria, divided into functional, cultural, and legal aspects, along with 21 sub-criteria. Table 11.7 provides guidelines for acceptable walking distances to various amenities. These guidelines are appropriate for densely populated cities in The Netherlands, and less appropriate for suburbs and on the countryside. The guidelines can be altered depending on the context. Table 11.8 outlines the parking standards for residential buildings in The Hague. - Norms are specified for various types of housing and sizes, and vary depending on the location within The Hague. Table 11.9 lists the gradual criteria for an assessment at the building level. The building scan consists of 14 main criteria, divided into functional, cultural, technical, and legal aspects, along with 28 sub-criteria.

Every question answered with 'Yes' in the gradual assessment of the location and the building indicates a favourable condition for conversion to residential use. The importance of the criteria varies by target group (see Table 11.3). For instance, students prefer to live close to entertainment options, while young families with children prefer to live in a quiet residential neighbourhood.

Important sources for obtaining the necessary data include conversations with the building owner, the municipality, local real estate agents, personal observations of the area, Google Maps, local maps, an inspection of the office building, and the previously mentioned databases such as government geodata (www.pdok.nl).

TABLE 11.6 Feasibility scan location based on gradual criteria

ASPECT	GRADUAL CRITERIA LOCATION	ASSESSMENT	
FUNCTIONAL		YES	NO
1. Urban location	1. Building in suitable area (not on remote industrial estate or office park)		
	2. Good sun exposure		
	3. Good view from building > 75% floor area		
2. Distance to and quality of amenities	4. Distance to grocery store for daily shopping 450-1000 m		
	5. Neighbourhood meeting places < 500 m		
	6. Restaurants/bar 500-1000 m		
	7. Basic medical facility 450-1000 m		
	8. Sports facilities 300-900 m		
	9. Educational facilities 250-900 m		
3. Public transport accessibility	10. Distance to small train station < 2 km and to main train station < 5 km		
	11. Distance to tram stop 200-500 m		
4. Car accessibility and parking	12. Distance to parking space 100-200 m		
	13. Good traffic flow		
	14. For urban areas: – Central areas > 0.9 parking spaces/100 m² office space – Pre-war city neighbourhoods > 1.1 parking spaces/100 m² office space – Post-war suburban areas > 1.4 parking spaces/100 m² office space		
CULTURAL			
5. Representatives	15. Centrally located (not near highways)		
	16. Other buildings present in immediate surroundings		
	17. Vibrant environment		
	18. Good reputation/positive image; no vandalism		
	19. Good air quality, minimal pollution and noise		
LEGAL			
6. Urban location	20. Noise level on facade < 50 dB		
7. Land ownership	21. Land owned or with long leasehold		
	Total location score (= number 'Yes')		
	Default weighting	5	
	Weighted total score		
	Maximum location score: 5 × 21	105	

TABLE 11.7 Acceptable Walking Distances to Various Amenities According to the Dutch Knowledge platform CROW

ACCEPTABLE WALKING DISTANCES FROM HOME TO...	
parked car	100-200 m
parked shared car	100-350 m
parking space with charging station	100-200 m
mailbox	150-450 m
waste container	50-150 m
bus stop (local bus)	200-500 m
bus stop (long distance bus)	250-900 m
supermarket	450-1.000 m
city centre/shopping area	500-1.500 m
workplace	250-1.000 m
school	250-900 m
restaurants, cafés	500-1.000 m
doctor/physiotherapist/pharmacy	450-1.000 m
hospital	450-1.000 m
cinema/theatre	450-1.000 m
indoor sports facility	300-800 m
outdoor sports facility	400-900 m

FIG. 11.1

FIG. 11.1 **Project De Meester (P.11)**
Parking policy was a major complication within this project.

TABLE 11.8 Parking Norms in The Hague for Different Types of Housing in Three Zones: Central Areas, Pre-War City Districts, and Post-War Suburbs

TYPE OF HOUSING	CENTRAL AREAS			PRE-WAR CITY DISTRICTS			POST-WAR SUBURBS		
	Rent	Buy	Visitor	Rent	Buy	Visitor	Rent	Buy	Visitor
APPARTMENTS									
< 40 m²	0,1	0,2	0,05	0,2	0,2	0,1	0,33	0,33	0,15
41-70 m²	0,2	0,33	0,05	0,33	0,5	0,1	0,4	0,66	0,15
71-100 m²	0,33	0,5	0,1	0,5	0,75	0,1	0,66	0,8	0,15
101-160 m²	0,4	0,75	0,1	0,5	1	0,1	0,75	1	0,15
>161 m²	0,5	1	0,1	1	1	0,1	1	1	0,15
SINGLE-FAMILY HOMES									
< 40 m²	0,2	0,25	0,05	0,33	0,4	0,1	0,5	0,5	0,15
41-70 m²	0,33	0,5	0,05	0,5	0,5	0,1	0,66	0,66	0,15
71-100 m²	0,4	0,75	0,1	0,66	0,8	0,15	0,75	1	0,2
101-160 m²	0,5	1	0,1	0,75	1	0,15	1	1,5	0,2
> 161 m²	0,6	1	0,1	0,75	1	0,15	1	2	0,2
CARE HOMES									
Care Housing up to ZZP 3	0,1		0,1	0,2		0,15	0,3		0,2
Care Housing ZZP 4 to 10	0		0,1	0		0,15	0		0,2
STUDENT HOUSING									
Student housing	0		0	0,05		0	0,1		0,05

TABLE 11.9 Feasibility Scan of Building Based on Gradual Criteria

ASPECT	GRADUAL CRITERIA BUILDING	ASSESSMENT	
FUNCTIONAL		YES	NO
1. Construction or Renovation Year	1. Building > 3 years old		
	2. Building renovated > 3 years ago		
2. Vacancy	3. Building is completely vacant		
	4. Building has been vacant > 3 years		
3. Building Capacity	5. Building capacity > 100 housing units/30 m²; Capacity depends on developer/investor; usually between 500-5,000 m²		
	6. Housing layout adaptable for local target groups		
4. Expandability	7. Horizontal expansion possible (no adjacent buildings)		
	8. Vertical expansion possible (no sloping roof/light construction)		
CULTUREEL			
5. Representativiteit	9. Recognisable compared to surrounding buildings		
	10. Achievable own residential identity		
6. Cultureel erfgoed	11. Not a (protected) monument		
7. Ontsluiting (ingang, liften, trappen)	12. Clear, safe, and visible building entrance		

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TABLE 11.9 Feasibility Scan of Building Based on Gradual Criteria

ASPECT	GRADUAL CRITERIA BUILDING	ASSESSMENT
TECHNICAL		
8. Maintenance State	13. Well-maintained (exterior and load-bearing structure)	
9. Dimensions - Shell	14. Sufficient building depth for corridors and homes with acceptable depth dimensions	
	15. Structural grid > 3.60 m	
	16. Floor height < 4.00 m	
10. Load-Bearing Structure	17. Safe condition of load-bearing structure (walls, columns, floors)	
11. Facade	18. Connection possibilities or grid < 5.40 m	
	19. Facade (openings) adjustable	
	20. Windows in facades can be reused/operated	
12 Installations	21. Sufficient shaft space feasible	
JURIDISCH		
13. Milieu	22. Absence of large amounts of hazardous materials	
	23. Sound insulation of floors > 5 dB	
	24. Good thermal insulation of facades and/or roof	
	25. Daylight access ≥ 10% floor area of new units	
14. Eisen Besluit bouwwerken leefomgeving; bereikbaarheid; vluchtwegen	26. Elevators present/feasible in building > 4 floors	
	27. (Emergency) staircases present or feasible	
	28. Distance from new units to stair and/or elevator < 45 m	
	Total Building Score (= number of 'Yes' answers)	
	Default weighting	3
	Total Weighted Building Score	
	Maximum Total Weighted Building Score	84

Step 4: Determination of the Transformation Class

Based on the gradual criteria for the location and the building, the transformation class of the building i.e., its conversion potential, can be assessed. The total scores for the location and the building are determined by multiplying the total number of 'Yes' answers by the weighting factors for the location and the building. Currently, the default weighting factor for the location is set at 5 and for the building at 3. Therefore, the maximum score for the location is 21 × 5 = 105, and for the building, it is 28 × 3 = 84, making a total maximum score of 189. The minimum score is zero if neither the location nor the building scores positively on any criterion. Based on the maximum and minimum scores, a classification into five different transformation classes has been made, as shown in Table 11.10.

TABLE 11.10 Determination of the Transformation Class

TOTAL SCORE LOCATION AND BUILDING	TRANSFORMATION CLASS
Weighted total score < 60	Class 1: Not transformable
Weighted total score 61-90	Class 2: Hardly transformable
Weighted total score 91-120	Class 3: Limitedly transformable
Weighted total score 121-160	Class 4: Transformable
Weighted total score > 160	Class 5: Very well transformable

For example, if 15 location criteria are positively scored and 18 building criteria are positively assessed, the weighted total score would be 15 × 5 + 18 × 3 = 129. This building falls into Class 4 and thus seems transformable into residential units. The transformation class is only an indication of the likelihood of successfully repurposing vacant office buildings into homes. The default weighting factors of 5 and 3 for location and building are somewhat arbitrary and can be adjusted by the user, either for the location and building as a whole or for each criterion individually. The classification into five transformation classes is also adjustable. Determining the transformation class is particularly useful when multiple buildings are involved, such as for a quick scan at the urban or district level or for a large portfolio. This enables to select office buildings that score high on adaptive reuse potential.

The accompanying box provides an example of a feasibility analysis based on the gradual criteria of the transformation meter.

FIG. 11.2

FIG. 11.3

FIG. 11.2 **Facade Alexanderveld 125 The Hague**
Source: W. Sybrand van Erve

FIG. 11.3 **Vogelvlucht Alexanderveld 125 The Hague**
Source: W. Sybrand van Erve

EXAMPLE A
Office Building Alexanderveld 125 in The Hague

The gradual criteria from step 3 and the transformation class in step 4 4 have been applied to the current main police headquarters at Alexanderveld 125 in The Hague. Based on the weighted total score of the gradual criteria for the location (= 75) plus the building (= 60), totalling 135, this project falls into Class 4: transformable. The building, designed by Wouter Sybrand van de Erve, dates from 1958 and was extended in 1981. It is a municipal monument, except for the later extension on Burgemeester Patijnlaan. The monument status was granted because Van de Erve is one of the prominent architects of the post-war period, and some of his earlier-designed buildings have been demolished. The building is also a representative and well-preserved example of office buildings from the reconstruction period www.monumentenzorgdenhaag.nl/monumenten/alexanderveld-125126) .

For several reasons, the building is of interest for potential conversion into residential use. In 2018, it was decided to construct a new headquarters for the police in the Binckhorst area. After the move to the new headquarters, the current building will be disposed, along with several other police buildings (Elisabethhof in Leiderdorp, Parkweg in Voorburg, and Overgoo in Leidschendam). According to Vastgoeddata.nl 2023, the Alexanderveld 125 office has an energy label of G. Starting from 2023, office buildings with an energy label of D or lower can no longer be used. Continuing to operate it as an office building would require a significant investment. An option to extend its lifespan is to convert the building to another use, such as residential. The building has some advantages. A few years ago, during a thorough renovation, asbestos was removed, a new air conditioning system was installed, lighting was improved, and a temperature regulation system using underground water was set up. The building has its own parking lot for 390 cars, partially below ground and partially under the extension. If this is insufficient, a developer could target a demographic that requires less parking space (such as students) or offer alternative solutions, such as car-sharing programs. What also makes the building interesting is its large size (approximately 48,317 m²). This size offers the potential to create a significant number of residential units. However, the size can also be a drawback. For a contractor, the large scale presents risks, and not every contractor may be willing to take on these risks. Additionally, a residential building of this size would put pressure on the existing local amenities and infrastructure.

Step 5: Risk Inventory Checklist

When the feasibility scans from step 1 and 3 indicate that the office building has potential for conversion to residential use based on its location and building characteristics, and the financial feasibility analysis from Step 2is also positive, the next phase in the planning process involves a more detailed exploration of potential risks and solutions to mitigate or manage these risks. Based on experiences from numerous projects, a risk inventory checklist has been developed, divided into risks related to the market and location, and risks related to the building itself, as outlined in Tables 11.11 and 11.12. The checklist is not exhaustive; the risks listed in the tables are categorised into functional, technical, cultural, financial, and organisational aspects.

TABLE 11.11 Risk Inventory Checklist Market and Locatio

MARKET AND LOCATION	RISK	SUGGESTIONS FOR SOLUTIONS
1. Functional	1. Insufficient parking spaces	Dependent on target groups; discuss parking standards; consider a parking garage.
	2. Lack of amenities	Include small-scale amenities within the building; collaborate with other parties.
	3. Lack of public transport	Consult with public transport authorities; collaborate with other parties.
	4. Unclear routing to the building	Analyse surroundings and possibly relocate the building entrance or add an additional entrance.
2. Technical	5. Odor nuisance	Insulation for the affected facade(s).
	6. Noise pollution	Explore exemption possibilities; add extra noise insulation to facade(s) or consider a secondary curtain wall.
3. Cultural	7. Poor reputation and/or unsafe neighbourhood	Improve the neighbourhood in collaboration with other parties; specific choice of target group to create a positive image.
4. Financial	8. Excessive purchase price of homes	Increase revenue by combining with (commercial) functions; adapt the design; focus on high income target groups.
	9. Poor let ability of dwellings	Enhance price-quality ratio; choose different target group.
	10. Need for additional amenities	Improve financial feasibility by including commercial functions.
5. Legal	11. Zoning plan change needed; zoning procedures	Consult with local authorities; ensure alignment with municipal policies.
	12. Land ownership: leasehold	Unfavourable for land value development; attempt to buy out leasehold.
	13. Soil contamination	Obtain a clean ground certificate from the owner; negotiate a lower sale price due to remediation costs.
	14. Maximum building height restrictions (e.g., due to heritage or air traffic regulations)	Investigate possibilities for horizontal expansion.

TABLE 11.12 Risk inventory checklist building

BUILDING	RISK		SUGGESTIONS FOR SOLUTIONS
1. Functional	1	Incorrect assumptions about building possibilities	Analyse form factors/ratios; gross-net ratios; expansion options (e.g., adding floors).
	2	Building too shallow	Adjust residential floor plans; increase depth with new facade/foundation; external galleries.
	3	Building too deep	Adjust residential floor plans; 'core out' the building (introduce new daylight); centralise entrances.
	4	No basement available (e.g., for parking/ storage)	Add a basement (depending on foundation and access possibilities).
	5	Excessive floor height	Introduce lightweight intermediate floors/mezzanines with lightweight interior walls.
	6	Non-opening windows	Replace (part of) the non-opening windows or complete facade renovation.
	7	Limited wall connection options to facade	Connect walls to (glass) panels or complete facade renovation.
	8	Absence of outdoor space	Dependent on target audience; consider prefab/French balconies; recessed facades; rooftop terraces; interior courtyards.
	9	Insufficient elevators/stairs (considering escape route requirements)	Install new elevators/stairs within the building (e.g., in a monument) or externally.
	10	Inadequate access options	Analyse various access options (e.g., corridors, galleries, central access).
	11	Insufficient quality/quantity of existing internal walls	Modify existing walls and/or add new walls (consider future flexibility).
	12	Insufficient water tightness of sanitary units	Add watertight finishings; install prefab sanitary units
2. Technical	13	Wrong assumptions about technical building characteristics	Check actual technical building characteristics, also regarding state of maintenance
	14	Insufficient or poor climate installations	Replace technical services by installations that fit with dwellings
	15	Insufficient pipes, ducts, and shafts	Expansion (consider fire separation per unit; cutting possibilities in existing floors).
	16	Insufficient water supply	Expand supply (consider individual regulation/measurement).
	17	Insufficient electrical supply	Expand (consider individual metering; CAI; telephone; individual regulation/ measurement).
	18	Insufficient sound isolation of floors	Improve isolation e.g., by adding a screed (concrete or 'floating floor'); insulate ceilings
	19	Inadequate thermal insulation of the facades	Improve insolation (outside or inside); add curtain wall
	20	Inadequate thermal insulation of windows	Replace by double or triple HR glazing; add curtain wall
	21	Inadequate thermal insulation of the roof	Insulate existing roof (outside or inside); replace by new roof; add top floors.
	22	Presence of moisture	Analyse causes (construction moisture, leaks, rising/penetrating moisture, condensation).
	23	Poor condition of joints	Clean and regrout facade (partially or completely).
	24	Insufficient daylight entry and solar access (< 10% floor area)	Use central corridors, additional atriums, bay windows, new larger windows; apply for exemptions if needed.
	25	Poor/dangerous condition of load-bearing structure	Renovate (consider additional reinforcement, shotcrete, adhesive reinforcement, auxiliary structures; fire resistance).
	26	Limited load-bearing capacity or poor foundation	Renovate; consider adding piles (steel, pressure or pulsation piles); spiral injection; ground displacement).
	27	Insufficient load-bearing capacity for adding top floors	Use lightweight steel and/or timber-frame construction for adding top floors

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TABLE 11.12 Risk inventory checklist building

BUILDING	RISK		SUGGESTIONS FOR SOLUTIONS
3. Cultural	28	Constraints due to municipal monument status	Early consultation with heritage protection agencies.
	29	Poor recognisability of the building	Add new facade elements; incorporate balconies, residential entrances.
	30	Entrance not clearly identifiable as such	Emphasise with an awning or relocate to a more visible position.
4. Financial	31	Difficulty in acquiring the property	Phased acquisition; initially leasehold, later freehold; joint purchase with others.
	32	Large investment required in early stages	Conduct financial feasibility analysis.
	33	Financial feasibility issues	Analyse expansion possibilities; combine with other (commercial) functions; seek subsidies.
	34	Risk of vacancy and deterioration (e.g., due to long development procedures)	Limit vacancy period through temporary rental or anti-squatting measures.
5. Legal	35	Presence of asbestos; removal compliance with costly regulations	Negotiate a lower purchase price or require an asbestos-free certification from the seller.
	36	Restrictions by Building Decree	Obtain exemptions for outdoor spaces, ceiling heights, accessibility, daylight, thermal/ sound insulation.
	37	Uncertainty about building permits	Early local consultations on requirements and required documentation.
	38	Insufficient integration of fire safety requirements	Early consultation on requirements and necessary documentation (access, escape routes, etc.).

FIG. 11.4

FIG. 11.5

FIG. 11.4 **Campus Diemen Zuid**
Source: Van Wijnen

FIG. 11.5 **Vibrancy Campus Diemen**
Source: Van Wijnen

EXAMPLE B

Risk Reduction: Campus Diemen South project, carried out by Van Wijnen

The former office park Diemervijver faced significant vacancy issues. It has been transformed into a student campus with approximately 936 units. The location's advantage is its proximity to metro and train station Diemen Zuid. Initially, there were few amenities, but the client saw the value and necessity of investing in these to enhance the feasibility of repurposing the site for residential use. Functions were added to the building plinths (supermarket, restaurants, cafes, gym), and the public space was redesigned to create a more attractive environment for students, including seating areas and a tennis court.

EXAMPLE C

Risk at the Location Level: Noise Pollution

Risk: Many urban locations are situated near roads, railways, and industrial functions. With the change in function to residential use, much stricter requirements apply, such as the maximum allowable noise load on the facade, necessitating additional measures.

Solution: Exemptions are often possible, allowing for slightly higher values. Noise pollution can also be mitigated through measures within the residences (sound insulation) and by installing noise barriers along the source. Another option is to place functions with less stringent noise requirements, such as workshops or wet rooms, on the facades most exposed to noise.

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EXAMPLE D

Risk at the Building Level: Financial Feasibility Issues

Risk: Offices often have a high purchase price, renovation costs may be higher than expected, and/or the office building may be too small to achieve a balanced budget.

Solution: Investments to make the existing building suitable for residential use can be recouped by expanding the building, both horizontally and vertically (adding floors). If these expansions stay within the existing ground area, no additional land costs are incurred. To add floors, the structural framework must be strong enough or able to be reinforced to support the additional levels. Expansions are subject to the conditions of the location. For building expansions, permission is required from various municipal departments (urban planning, image quality, building supervision, fire department). Another way to improve financial feasibility is by adding commercial spaces, office spaces, or commercially renting out the ground floor and parking areas. Agreements can be made with the municipality regarding subsidies and necessary exemptions from the Environment and Planning Act (Bbl), for example, concerning daylight access, elevators, accessibility, and soundproofing materials. If certain requirements are not mandatory, construction costs can be significantly reduced. Of course, safety must not be compromise

11.3

Related instruments

The transformation meter for offices is specifically designed for repurposing offices into residential units. The principles and criteria are also applicable to other types of repurposing with minor adjustments. For instance, repurposing offices into hotels or combinations of new functions (see Chapter 12 for Michel Hek's Repurposing Guide). Together with architects from the BNA, a checklist was developed for repurposing offices into care homes (Remøy & Van der Voordt 2011). Additionally, the repurposing potential of other types of buildings, such as bank buildings, churches, asylum centres, industrial heritage, cultural heritage like municipal and national monuments, retail spaces, senior living complexes, and temporary use has been investigated. Consulting and engineering firms often use their own tools, such as the ABT-quick scan, focusing on technical aspects. Many instruments are described in a previous book on the conversion of offices into residential units (Van der Voordt et al. 2007). This book also describes the so-called vacancy risk meter: a tool to predict which office buildings are at increased risk of vacancy (Geraedts & Van der Voordt 2007). For the repurposing of national real estate at the portfolio level, an evaluation plan was developed by the Atelier Rijksbouwmeester, considering the societal interests of local residents (Remøy et al. 2013). Internationally, opportunities, obstacles, and risks of repurposing have also been mapped and assessment criteria developed (Bullen & Love 2011; Dyson & Love 2015; Misirlisov & Günce 2016; Baker et al. 2017; Chen 2017; Ragheb & Naguib 2021; Singh & Solanki 2022; Vafaie et al. 2023). Many criteria overlap. A good comparison of different multicriteria models can be found in Nedeljkovic et al. (2023).

11.4

Conclusions

Previous applications have shown that the transformation meter is a useful tool for systematically determining which vacant office buildings are suitable for repurposing into residential units, progressing from a broad overview to more detailed analysis. During exercises with architects, it was observed that they often first examine the location and building characteristics, then draft residential units into existing floor plans, and only subsequently use the transformation meter as a check for “have we considered…?” (Remøy & Van der Voordt 2011). Developers typically work intuitively based on professional knowledge and experience. For them, the transformation meter is also useful as an assessment tool and for comparison with their own criteria. For public parties and less experienced stakeholders, the transformation meter can be useful from the outset, supporting decision-making for a go or no-go and further planning development.

Possibilities for further improvement of the transformation meter include making the criteria more visual (photos, principle sketches), digitising the tool, and documenting experiences in professional practice, including transformation scores and cost/benefit analysis, to provide more reference material.

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