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A new life

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A NEW LIFE: TRANSFORMATION OF VACANT OFFICE BUILDINGS INTO HOUSING

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ABSTRACT

Office buildings are experiencing vacancy. This leads to financial problems for the owners and social problems for the community, e.g. vandalism and deterioration. A solution may be found in transformation of vacant buildings and changing the buildings' program. In the Dutch situation, housing is a valid function, given the tight market. Housing traditionally correlates well to other functions of the city core, such as culture and leisure. Most well-known examples of transformation consider buildings with a proven architectural quality, while vacancy-threatened buildings are often part of the non-eloquent building stock. Does transformation make sense in that case? What are the opportunities, threats and risks? Which are the critical success factors? In this contribution we will discuss financial, functional, structural, technical and architectonic issues and the impact on the urban context, both theoretically and empirically by presenting a number of interesting cases.

Keywords: Transformation, vacancy, offices, housing

INTRODUCTION

Problem

At this moment, in the Netherlands about 5,600000 m² office space out of 40,000000 is vacant. This is a percentage of 14 while 3-5% is seen as necessary friction vacancy, to provide for movements and growth. A part of this vacancy, about 1,500000 m² is structural which is defined as vacancy of the same floor space for more than three consecutive years. (DTZ Zadelhoff, 2005)

Vacancy is a problem on different levels. Economically, vacancy hits the owner of a building directly. For society, vacancy is a problem of insecurity and social uncertainty and may bring about criminality; ranging from vandalism and graffiti to break-ins, illegal occupancy and fires. As such, vacancy also has indirect effects through the negative image that it puts to the surrounding area and buildings. This can lead to deterioration of the area, with rising vandalism, technical decay and devaluation of its buildings. At the same time, the tight Dutch housing market presents a potential use of vacant office buildings. In 2004 the Dutch minister of Housing promoted to build at least 25,000 dwellings within five years by transforming empty office space into housing.

Objective

Transformation is only one of the possible ways to solve the problems of vacancy. The owner of a vacant building can also choose to have the vacant building demolished and build something else, he can have it renovated and rented out again as offices, he can sell it or he can simply do nothing; just hope for better times and wait for someone to rent the building.

This paper aims to answer the following questions:

- 1) What makes transformation a good option for dealing with vacancy?
- 2) Which buildings are suitable for transformation from office building to housing?
- 3) Does transformation of the non-eloquent building stock make sense?

In answering these questions, we use numbers from DTZ Zadelhoff (one of the largest Dutch real estate brokers) and Neprom (Dutch association of project developers) and input from earlier studies resulting in methods and instruments for deciding the transformation potential. We present two case studies of delivered transformation projects. These cases describe the use of the instruments and give information from Dutch practice on the feasibility of transforming the non-elocquent buildings mass. These cases, together with twelve others that are being studied now, will be presented in the book "Transformatie in Nederland" [Transformation in the Netherlands] that will be published in 2006.

VACANCY

Market

Vacancy of office buildings has risen worldwide since the year 2000. Driven by the growth of the new economy, high-risk investments in real estate property increased at the end of last century. The burst of the internet bubble in 2001 was accompanied and reinforced by economical decline and the worsening competition position of the Netherlands in general. (Research by Buck Consultants International 2003) The effect on the real estate market was devastating. As a result of the cyclic behaviour of the real estate market, a huge amount of buildings were at that moment being developed or built, and until now, buildings which were initiated before 2001 are being finished. Vacancy related to the conjunctures in the real estate market is probable to be solved when the situation on the market betters. But conjuncture related vacancy can easily become structural vacancy. Organisations which move to new office buildings often leave behind buildings which do not fit present performance requirements. A structural lower demand of office space is expected, due to the decrease of the labour force through ageing and the worsening competition position of the Netherlands that leads to outsourcing of work to lower income countries. Part of the vacancy thus derives from the market and economical changes. But location and building also play important roles.

Location

Some office locations are preferred to others, on local and regional level. Parts of a city try to defeat each other but especially for bigger firms location is chosen on regional givens; national or even international. There are several reasons why some locations are less wanted than others, for instance bad accessibility by public transport or car and bad parking possibilities. Another factor can be the negative image of the area created by a poor spatial and visual quality. Agglomeration factors, such as other similar firms moving out, lack of facilities and a concentration of ageing premises are also important. Finally urban planning and zoning play an important role. For instance, mono functional areas are more probable to experience vacancy; urban districts deteriorate due to negative market developments in a certain branch. Municipality plans for changing the use of the area can also influence prospects on future development possibilities and thus trigger vacancy.

Building

Reasons to leave a certain building are negative image or identity through a bad spatial-visual quality, decay and shabbiness of the building or evidence of vandalism. Or the technical quality of (parts of) the building are in a poor condition or its installations are out-of-date or malfunctioning (Healy and Baker, 1987) The functional lifespan of a building is over if the

building is not able to meet the requirements of new office space, as in lack of flexibility in rearranging space or inefficient use of space or poor accessibility. A big amount of the structural vacant office buildings are built between 1960 and 1980 (Neprom, 2003)

BUILDING STOCK

Transformation to decrease the office supply

On the Dutch market, there are 5,6 million square meters of office space for rent at this moment. Most of these meters are vacant. Owners of office buildings let out their building at low rates to try to keep them on the market. This leads to a general decrease in rents and income. The vacant buildings with huge “for rent” signs are bad commercial for the owner. Taking some of the non-conform buildings off the market will lead to an increase in rents, as supply and demand will correspond better. According to DTZ Zadelhoff, a significant part of the office space - approximately 1 million square meters - should be taken off the market. Many office buildings are functionally or technically outdated and not flexible enough to be refitted, or have a bad spatial-visual quality. Or the urban context of the buildings is experienced as bad, from bad accessibility, too little parking possibilities; the building is situated in a housing area or is affected by other agglomeration factors.

Transformation to increase the housing supply

The Dutch housing market is stressed. The numbers considering scarcity of dwellings are various, but about 800 000 to 1,000 000 dwellings are needed. Existing office buildings can of course be demolished and new buildings for housing can be built. Transformation of existing building structure is sustainable though; building materials are reused, the morphological structure of an urban area is kept. This adds up to an understanding of the place and increases its historical value. Transformation also saves construction time. For projects which have to be delivered in a short time-span, this makes transformation especially interesting. And, for both options, there's no need to conquer inbuilt land, which is already scarce in the Netherlands.

WHICH BUILDINGS ARE SUITABLE FOR TRANSFORMATION?

Market

The longer a building has been vacant, the more likely the current owner will be willing to transform or to sell the building. Subject of our research is the structural vacant building stock, defined as vacancy of the same m² for three consecutive years in a building that has been delivered more than three years ago.

Location

Locations in the inner cities or on the edge of the city are interesting locations for housing developments. Due to bad accessibility by car and bad parking opportunities, several office buildings on such locations are having vacancy problems. Many of the vacant office buildings though are situated in office/industrial parks or along the highway. Highway locations are badly accessible by public transport and air- and sound- pollution are severe

problems. These locations are under the current circumstances not suitable for housing. Office/industrial parks though can be; by transforming bigger parts of an office location an interesting housing environment can be created. Different locations correspond to different housing types and different target groups. If a location is found suitable for housing, the next question is who, which target group, will like to live there?

Building

Ranging from reprogramming to demolishing everything but the structure, most buildings have a certain transformation potential. A specific kind of buildings is that which has recognised architectural qualities or has a monument status. The transformation and reuse of these buildings almost always succeeds, so be it with economical loss. The architectural quality or monument status will be kept without too big changes in the façade or other characteristics. A program can be sought to reinforce the value of the building. The other extreme is the non-eloquent building stock. Apart from their non-present architectural quality, these buildings are often of poor technical or functional quality. They are outdated but as revealed in our case studies, they can possibly be transformed into housing. There are few definite vetoes to the building structure itself, but the floor height must secure the minimum floor height defined by Dutch building laws. This minimum is currently speaking 2,60m of free height. Other important factors are the economic feasibility of transformation and urban zoning plans prescribing a certain function.

Instruments

In order to be able to judge office buildings on their potential for transformation into dwellings the “transformation meter” (Table 1) has been developed by Geraedts and Van der Voordt (2002). This instrument consists of criteria to measure opportunities and risk. The criteria used consider internal building and location aspects. While only a few internal building criteria are absolute, more of the location criteria can be the source to a negative transformation advice. Depending on the target group, the transformation of the building can be made economically feasible; the location though can not be changed. The transformation meter is developed to assist decision making at the beginning of a possible transformation trajectory.

In her thesis research at the University of Delft, Nicole de Vrij (2004) discusses a number of methods that have been developed to decide which buildings are suitable for transformation. The outcome of this research is a definition of four evaluation instruments, based on the “transformation meter”. De Vrij validates her method through case studies of 11 transformation projects. First step is a *quick scan*, using the criteria of Geraedts and Van der Voordt plus a few additional criteria, such as: the lack of an enthusiastic developer, the owner is not willing to sell the office building or the city council is not willing to change the zoning plan. Further, a rough feasibility study is executed in this first phase. By applying this instrument; office buildings that are not suitable for transformation into dwellings are quickly identified. Secondly, *potential target groups* are recognised based on the local market, location and building. Third, the *feasibility model* gives an insight in the financial/economic feasibility of the project. Target groups are matched with rental prices and idealised floor plans. The idealised floor plans can be used to divide the office space into dwellings and an estimate can be made of the number and type of realisable dwellings. Development calculations can be made using costs and incomes. Fourth, a *checklist* makes a comprehensive risk inventory possible. Most risks can be averted when signalled in advance.

Specific characteristics of the transformation project are listed, providing solutions for frequently occurring problems, organised by location and building characteristics. These are again subdivided into legal, economic, technical and functional/architectonic aspects.

Table 1: Criteria for low transformation potential (Geraedts & Van der Voordt, 2003)
(The more checkmarks, the higher the risk, the lower the transformation potential)

Aspect	Criterion	✓
Location		
Urban situation	Office on remote industrial zone Office in the middle of an office park Office in area defined as priority area for offices	
Land property	Land rent	
Vacancy	Vacancy more than one year Vacancy of surrounding buildings	
Character of urban situation	Location on or near city edge, ring roads Desolated area No greenery in the neighbourhood Social depreciation, vandalism Pollution; smell, noise, view	
Distance and quality of facilities	Shop for daily errand >1km Meeting place (café, snack bar, etc) >500m Bank/post-office >2km Basic medical facilities (doctor, pharmacy) >5km Sport facilities (fitness, swimming pool, sports park) >2km Educational facilities (nursery, school, university) >2km	
Accessibility by public transport	Distance to station >2km Distance to bus, metro, tram stop >1km	
Accessibility by car; parking	Many obstacles, limitations, poor flow Distance to parking place >250m <1 parking place/100m ² dwelling realisable	
Building		
Year of construction	Building was built or renovated recently (3 years)	
Character of the building	Unrecognisable, non-eloquent Bad maintenance	
Extensibility	Not extensible horizontally Not extensible vertically	
Structure	Structure in technical bad condition Dense structural grid; <3,6m	
Dimensions	Net storey height <2,6m	
Façade	Façade openings not adaptable Impossible to create windows which can be opened manually Daylight entry <10% of the living area	
Entrance (building, dwelling)	Impossible to create a socially secure entrance Impossible to realise elevator in the building (if more than 4 floors) Distance from dwelling to stairs/elevator >50m Impossible to realise escape stairs as according to escape-demands.	
Installations	No or insufficient conduits realisable	
Environment	Noise level at the façade >50dB Sufficient isolation between dwellings impossible Sufficient isolation of façade impossible Presence of dangerous materials in construction No or little sunlight	

The instruments developed at the University of Delft coincide with research done by James Barlow and David Gann (1993), presented in a report by the Joseph Rowntree Foundation. Their research focuses on the variables of buildings, owners, planning consent, finance and economical feasibility. These variables were isolated and researched. Cases were used to validate the research.

BRAKES, TRIGGERS AND RISKS

Brakes

One of the obstacles for transformation is the specialisation in competence of the actors on the real estate market. Developers, investors and owners of office buildings have little knowledge of other branches of the real estate market. Another problem is the price asked for vacant office buildings and the costs for transformation, compared to the incomes from the new function. The prices are kept high through using unrealistic high book values. These values often don't correspond with the market value of the object in question and make redevelopment impossible. Until 1996 the rent per square meter office space was higher than the rent per square meter housing space. The value of offices is decreasing, while apartment prices continue to rise. This problem is thus getting smaller but is still an important issue due to the costs of the transformation. Because of this, many investors and owners choose to keep their building on the office market, waiting for better times.

Municipal zoning plans and Dutch building laws are other brakes. Trying to develop housing in an area scripted for offices can lead to juridical debacles lasting for 18 months. With such uncertainties, transformation is difficult. The building laws are different from offices and housing. Especially escape during fire, daylight submission and the noise level of the surroundings ask changes in the building structure which can lead to high costs or even make transformation physically impossible. Another problem is raised by the location of the vacant premises. Half of the vacant buildings are located in industrial areas and are considered unsuitable for transformation because of the characteristics of these locations.

Triggers

Knowledge about transformation and different fields of the real estate market is crucial to trigger transformation projects. Keeping a structural vacant building in the portfolio costs money and leads to financial loss. Redeveloping the building can be a better option. Seen as advantage of a transformation project is the short time-span through which a transformation project can be developed. Transformation is a sustainable way of developing housing through re-use of buildings or parts of buildings. If a commercial program can be added to housing, the project can easier be made economically feasible. Another trigger is the scarcity of space. Finding a central location for housing development can be difficult, finding a centrally located, vacant office building is easier. Redeveloping central locations again can help to upgrade inner city areas and attract other investors.

Social housing corporations are a specific group of actors on the real estate market. For a social housing corporation, not only the economical feasibility is important, but also the social feasibility. Another characteristic of these corporations is that they don't require immediate return on their investments. The demanded return on investment is also lower than for a commercial developer. For these reasons, social housing corporations are more likely to take on a transformation project.

Risks

Through our case studies, we have learned that the big risks in transformation projects come from more sources; one being the building itself, others being market or the municipality. Especially older buildings don't correspond with the drawings or other available information;

e.g. the construction turns out to be made of bricks, not concrete, the distances between columns is not the same throughout the whole building or the construction contains hidden asbestos. This implies hidden costs that are revealed during construction. Another problem that was stated in two of our cases is the housing market. At the moment that these developments started, the economy was increasing and the housing market was booming. At the moment of selling the apartments though, the market was saturated and some of the apartments turned out to be difficult to sell. A third problem is due to procedures which have to be run at the municipality. Procedures for changing zoning plans or getting permission not to work with standard building laws can take long time. This means that the time gained through transformation is lost through procedures.

These risks can be eliminated through better planning strategies. In feasibility studies the chances of problems like weak construction floors, asbestos, and old installations should be recognised. The choice of dwelling type and size should be based on serious analyses. Feasibility of the project can be reached through diversity, both in dwelling type and by adding another function to the building, as for instance commercial space on the ground floor. Agreements should be made with municipalities before starting a transformation project; this would lead to better cooperation during the transformation process.

CASES

Introduction

To explain the transformation process and main risk and success factors we will present two case studies. The introduction to each case describes the actions taken at the beginning of each project, responding to the quick scan and feasibility study as developed by De Vrij. The cases are selected because they were not architecturally stunning buildings and not monuments which cannot be legally destroyed. The success of these projects has to be explained through economical and social feasibility.

1. Student housing in Groningen

The first case study is taken from Groningen in the Netherlands. This office building was built in 1980 for Dutch telecom company KPN, in the centre of the city. KPN had moved out and the building was vacant when the housing foundation *In* marked it as an interesting place to realise student housing. The reason for the interest of *In* was the location of the building in the city centre, close to public services and city (night) -life and near other facilities that the foundation rented out as student housing. The corporation was also the developer of the project. Through a feasibility study the office building was regarded as suitable for housing. The building was already put up for sale, but the price was originally too high. After some extra months of vacancy and intensive negotiations by the housing association, the price was lowered till an acceptable level. During the feasibility study, appointments were made with the municipality in order to be sure in advance that changing the zoning plan would be no problem.

Feasibility

Before buying the building, a feasibility study was done as to ensure economical feasibility. The building structure is a simple concrete structure of columns on a 5400 grid. In the centre

of the building there's an elevator, the staircases are situated on each end of the building. This granted that nothing had to be done to the building as to make sure it would apply to the prescriptions for fire-escapes. Another important factor was the state of the façade. The restrictions on noise on the façade are harder for housing than for offices (max 50dB for housing compared to max 60dB for offices). The façade did not meet standards for housing, but the municipality was willing to make an exception. Another common problem is that in many offices, windows can't be opened manually. In this building though, most windows could be opened, or at least one window per structural bay. This was an important factor in keeping down cost for reconstruction. A third factor that can add up on the costs of restructuring is the internal installation. Heating, air and electric installations could be re-used. Sub-meters were placed as to measure electricity used by each unit. Radiators were re-used and got added meters as well.

Design

Little was done about the design of the building. The entrance was refurbished, as to allow for 83 students to use it on a daily basis. In the wall, 83 post-boxes were placed, together with 83 doorbells. A program was set up in agreement with the mayor student organisation in Groningen. This resulted in rooms of 20-25 square meters, with an own kitchen and bathroom and an own address, mailbox and doorbell. Dividing walls between the units were made sound- and fireproof by using layers of gypsum plates. In this way, as little as possible weight was added to the construction. The transformed building is an anonymous one, little was changed physically, but the use of the building is radically transformed.



The façade of the building has not been altered

2. Luxury apartments in Eindhoven

An office building dating from 1958, originally built for the municipality health care office, later used as municipality offices, was recently abandoned. The building was not a monument, but the municipality thought it should be reused. A competition was held for real estate developers in cooperation with architects; the winning developer could buy the premise and would agree to transform the building into housing. During the state of competition, research was done as to find out whether the building was suitable for housing. A feasibility study was also done. The developer, who won and got the right to develop the project, was a professional real estate developer, with the aim to develop and sell the apartments. As it happened, a commercial housing corporation later bought all the apartments.

Feasibility

A feasibility study was done as part of the competition. In this case, there was not a pre-defined profile of the renters or buyers. The developer together with the architect looked at the possibilities to fit apartments in the existing structure. Together with the costs that had to be made in order to make the façade work technically, only top-end apartments were calculated to be economically feasible. The neighbourhood where the building is situated was also thought to be a suitable location for top-end housing. To create extra income and add value to the urban setting, the base of the building was filled in with commercial program (a pharmacy and a health centre).

Design

The existing building had various technical disadvantages, for instance the façade was outdated and not energy efficient. The floors were too thin to function well as the division between two apartments. There were several possibilities to solve these problems. Finally one concept was chosen that would solve all the technical problems; each apartment was designed as a box that was placed in the existing structure like a drawer in a chest of drawers. This solved as well the isolation of the interior walls and floors as the façade. During construction though, it became clear that the building also wasn't built to modern standards. The measurements of the columns and the distances between varied from floor to floor. The 'drawers' had to be manufactured specially for each unit. This was causing high extra costs. Another factor adding up to the construction costs was the state of the existing construction. Although the façade was radically altered, the characteristic structure of the building and its identity were kept. (Photo's 1 and 2) The large scale left over spaces that this building comprises, are kept public and open. This is one of the obvious qualities that are provided by the existing structure and which could not be provided for through a new building built specific for its use.



Office building in use as office



Office building transformed into housing

REFLECTION AND CONCLUSION

Most examples of transformed buildings are examples of successful architecture; buildings which become monuments. These buildings will be reused, whether it's functionally efficient or not. Transforming non-descript and unarticulated buildings makes sense from the point of view of sustainability, both ecologically and urban. These projects will only be interesting for developers if they can be made economically feasible.

In our case studies we have looked at buildings which are kept because of economical and social feasibility. In these projects there are strong connections between target group, location and the transformation costs; the former KPN building central in Groningen is interesting for student housing because of its location. The project was feasible as such because of a reasonable price, the façade did not have to be altered and the fire escapes were satisfactory. In the Eindhoven case, the façade had to be completely renewed because of severe technical problems. The building was completely stripped; the only parts to be reused were the concrete skeleton and the staircases. The construction even had to be reinforced. The transformation could only be made feasible if developed as top-end apartments. The location added force to this conclusion.

REFERENCES

- Barlow, J. and D. Gann, *Offices into flats*, James Rowntree Foundation, York, 1993.
- Buck Consultants International, *De internationale concurrentiepositie van Nederland*, Neprom, Nijmegen 2003. [The international competitiveness of the Netherlands]
- DTZ Zadelhoff, *Cijfers in perspectief*, Utrecht 2004, 2005 [Data of office buildings]
- Geraedts, R. and T. van der Voordt, *Offices for living in*. An instrument for measuring the potential for transforming offices into homes. Proceedings CIB Conference W104, Open Building Implementation, pp 207-229, Mexico, October 2002.
- Geraedts, R. and T. van der Voordt, *Good Buildings drive out bad buildings*. An instrument for defining the lower end of the office premises market. Proceedings CIB Conference W104, Open Building Implementation, volume 2, pp 40-51, Hong Kong, October 2003.
- Geraedts, R. and N. de Vrij, *Transformation meter revisited*. Three new evaluation instruments for matching the market supply of vacant office buildings and the market demand for new homes. Department of Real Estate & Housing, TU Delft, 2004.
- Healy and Baker, *National Office Design Survey*, London 1987.
- Neprom, *Aanbodmonitor kantoren, Voorburg 2003* [Monitor of office supply]
- Vrij, N. de, *measuring is knowing?* Graduation thesis Department of Real Estate & Housing, TU Delft, 2004.