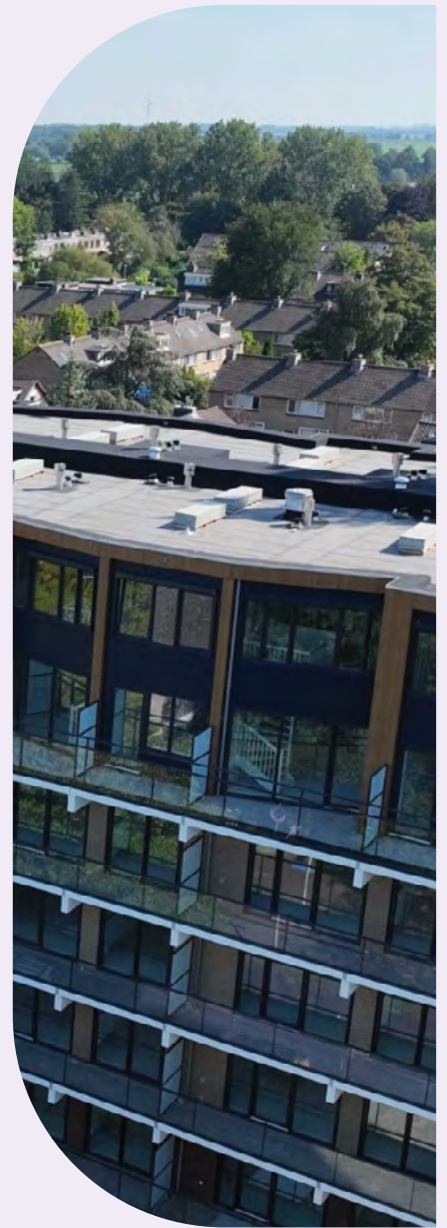
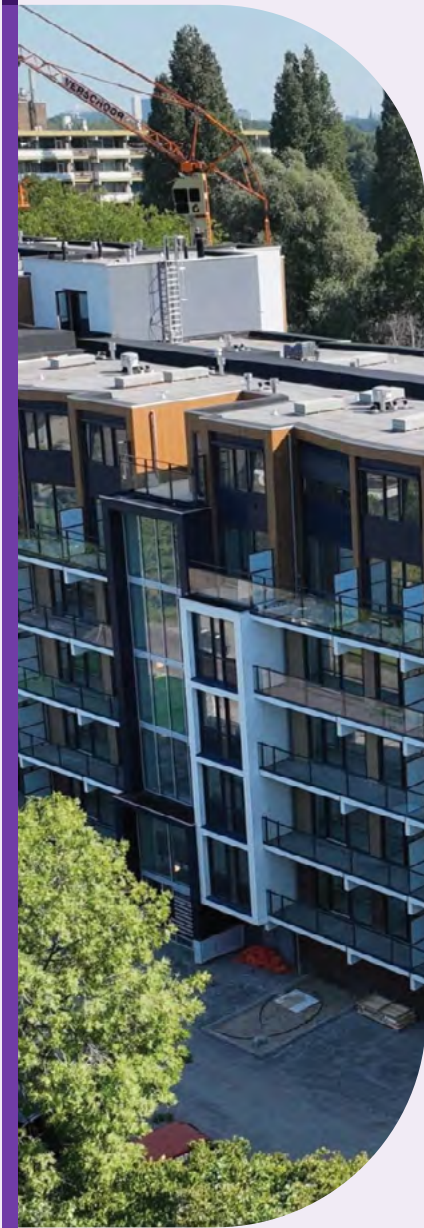


Vertical extension inspiration guide

Dutch examples and lessons learned



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Colophon

This guide was produced as part of the project “Mod nye højder”, a collaboration between [Structural Collective](#), [Tegnestuen LOKAL](#) and [Smith Innovation](#), funded by [Bevar Mere](#).

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All project examples and images in this guide have been referenced and credited to the best of our ability, with links to original sources provided where available. If any attribution is incorrect, incomplete, or missing, this is entirely unintentional. Please do not hesitate to contact us so we can make the necessary corrections.

Introduction

Cities across Denmark and the Netherlands are facing similar challenges: how to create more housing in dense historical cities while achieving affordable healthy living environments and sustainability targets? Suitable development sites are scarce, land prices are high, and large-scale new construction requires long planning and construction processes with intensive environmental footprints. What if the answers to this were not found by looking outward but **upward**?

Vertical extension, the practice of adding one or more storeys on top of an existing building to create new homes, can offer a promising and practical solution. Historically a common method for creating more space in city centres, vertical extension became less practiced for various reasons, but interest is now on the rise again. It addresses growing housing demand, limited land availability, and the need to develop more sustainably, all at once. This inspiration guide brings together real-life Dutch examples and lessons-learned to inspire Danish stakeholders from building owners to architects, developers and local governments.

This inspiration guide introduces vertical extension as a proven strategy for increasing housing supply with social, economic and environmental benefits. While additional storeys can also be added to offices, hospitals, schools, and cultural buildings, the focus of this publication is on creating additional housing units.

The benefits of vertical extension are wide-ranging: locations already exist, removing the need to acquire expensive land and avoid sprawl to reduce competition for land with nature and agriculture. Revenue from new homes can finance sustainable renovations and maintenance, which benefit current residents too. Industrialised construction with lightweight biobased materials can speed up construction and reduce environmental impacts simultaneously. And building upward makes efficient use of existing infrastructure and public facilities. It can strengthen social cohesion and stimulate housing mobility in neighborhoods.

In the Netherlands, using vertical extensions to address the housing demand has gained increased momentum in recent years, driven by both the need to develop housing swiftly while delivering on livability and sustainability ambitions. National policies increasingly encourage its application,¹ and several municipalities have integrated vertical extension into their housing strategies, though successful implementation remains highly dependent on local stakeholders and conditions.

Danish and Dutch cities share many similarities: compact urban forms, historic inner cities, extensive post-war 3-6 storey apartment neighborhoods, urban environments that support strong cycling cultures, and a high appreciation for architectural quality and aesthetics. Ownership structures are comparable as well, with (social) housing associations, institutional investors, and home-owner associations playing key roles. These parallels create fertile ground for exchanging experiences and lessons learned.

This inspiration guide is part of the project “Mod nye højder,” developed in collaboration with Tegnestuen LOKAL architects and Smith Innovation and funded by Bevar Mere. This guide is intended to inspire Danish building owners, architects, developers, and local governments to explore and apply vertical extension more widely.



Image: Mei Architects

¹ National housing strategy - tackling housing shortage - vertical extension

Types of Vertical Extensions

There are many different types of vertical extensions for housing. An extension can either be made to expand existing housing or to create new housing units. While we recognize that expanding existing housing has benefits such as enabling young growing families to remain in city centres, this is not the focal point. For this guide we specifically **focus on vertical extension for creating new housing units**. Within this, different types can be differentiated. First of all there are different types of existing buildings that the extension can be placed upon. Secondly, the amount of added storeys can vary greatly.

The table illustrates a couple of different types, but naturally more options are possible. For this inspiration guide the focus is on **type A** vertical extensions, as this seems most relevant for the Danish context. However, as can be seen in the table, there are many other possibilities and for each there are numerous examples in the Netherlands, as well as other countries. A handful of interesting Dutch examples are shared here and four will be discussed in more detail later in this guide to elaborate on ownership structures and challenges.

		Type of existing building			
		 Historical row-houses	 3-6 layer apartment buildings	 (Industrial) Heritage buildings	 Modern utility buildings
Type of extension	 1 - 2 storeys with new housing	Rare - usually only extensions of existing homes	A	C	E
	 3 or more storeys with new housing "building on top of a building"	Virtually non-existent	B	D	F

A Type A is the focus of this inspiration guide



Lage Land - Rotterdam

A light-weight steel frame extension on top of a 3 storey apartment building from the 60s. Special was that all residents remained in their homes during the construction of the extension in 2007.



Dillenburgh - Leidschendam

A 6-storey apartment building from the 60s was completely renovated and a 9-storey extension was added on one side. Densification improved the social fabric of the neighborhood.



Stadstimmertuin - Amsterdam

An historic monumental Jewish School in the city center was extended and transformed into luxurious city lofts.





School - Roosendaal

A contrasting two storey extension on a heritage building that was formerly used as a school in Roosendaal.



Fenix - Rotterdam

A striking steel table structure built through the historic 1922 Fenix warehouse. The table structure carries the 9 storeys with 212 apartments and an inner garden above the century-old monument.



Venusstraat - Scholenburg

A former office building was transformed to housing and a third storey was added in light weight timber frames.



UpMountain - Amstelveen

A former shoppingmall has been boldly transformed and renovated and 45 luxury apartments were built on top of the existing parking garage.

International examples

The [Optoppen platform](#) brings together a growing library of vertical extension projects from across Europe to inspire. It allows practitioners to easily submit their own projects.

Note that entries are not independently verified so treat it as a starting point for inspiration and always contact the architect or developer directly for more project details.



Discussed in more detail later in this guide:



Aquarius



A.J. Ernststraat



IJdoornlaan



Klapwiek



The benefits of vertical extension

Using vertical extension to realise housing offers a compelling combination of social, economic, and environmental benefits. The benefits and costs may be different for different stakeholder groups involved but these are the key advantages.²

Economic Benefits



No land acquisition costs - The location already exists so no new ground needs to be purchased. Instead of searching for scarce and expensive building plots, development takes place where infrastructure, public transport, schools, and services are already in place.



Revenue funds building improvements - Income from renting or selling the new homes can finance renovations, energy upgrades, and maintenance of the existing building, directly benefiting current residents.



Standardisation and prefabrication potential - Many 3-5 storey apartment buildings, especially post-war from 50s-80s, were built with standardised dimensions, making them well-suited to more standardised industrial solutions. Prefabricated timber modules are developing rapidly, reducing time, cost, and on-site disruption and increasing scalability of the business model.

Social Benefits



Improved accessibility - Adding floors to 3-5 storey buildings often creates the opportunity/necessity to install an elevator, improving accessibility for all residents and especially for elderly enables aging in place.



Housing mobility - New homes targeted at specific groups, such as seniors or first-time buyers, can trigger a positive chain of moves within a building or neighbourhood, freeing up homes and supporting local housing mobility.



Neighbourhood revitalisation - Additional housing strengthens local facilities and services, supports social cohesion, and can spark a positive cycle of investment in neighbourhoods.



Faster building - Vertical extension projects can typically be realised faster than ground-bound projects providing homes sooner when demand is high. Also the actual construction time can be reduced to months or even weeks (instead of years for ground-bound) thanks to prefabricated light-weight timber constructions reducing nuisance of construction for current inhabitants and the surrounding neighborhood.

Environmental Benefits



No land conversion - Building upward avoids the need to develop on new (greenfield) sites, preserving public areas in already dense cities where land is scarce and avoiding sprawl to maintain space for agriculture and nature outside the city. Land-conversion is the single largest cause for biodiversity decline.



Biobased construction - Vertical extensions are well-suited to lightweight biobased materials such as timber, which reduce the structural load on the existing building and significantly lower the ecological footprint of the new homes.



Combined with sustainability upgrades - Vertical extension can be integrated with planned renovations and sustainability improvements for the entire building. This optimises costs and reduces disruption for residents but most importantly can significantly improve the energy requirements and footprint of the homes.

² Mainly based on: [Stec Groep \(2025\) Handreiking optoppen 2.0](#), [National approach vertical extension \(2024\)](#), [CCS guidebooks](#) and interviews. The Dutch ministry gathers relevant [publications on vertical extension here](#).



Different types of building owners

Vertical extension is relevant to all types of building owners, but each brings its own interests, capabilities, and constraints to the table. Understanding these differences helps tailor the approach and identify where support or collaboration may be needed. Generally three types of building owners can be distinguished: (social) housing associations, institutional investors, and homeowner associations.³



(Social) Housing Association

 **Danish:** (almen) boligforening

 **Dutch:** (sociale) woningcorporatie of woningbouwvereniging

 **Primary interest:** Providing citizens with suitable, affordable homes.

Advantages for vertical extension:

- Not profit-driven, so a modest or cost-neutral return is sufficient to justify a project.
- Access to capital at relatively favourable interest rates.
- Professional experience in commissioning and managing construction projects.
- Strong alignment with vertical extension's social benefits: adding affordable units, enabling ageing in place, and improving existing stock.

(Potential) Disadvantages for vertical extension:

- Internal governance structures can slow decision-making, and consultation of current residents is typically required and any objections or concerns can delay the process.
- Regulatory constraints, such as fixed maximum rent levels for new homes, may limit financial flexibility and make it harder to close the business case.



 **an example of a project**

where renovations were combined with vertical extension (p. 12)

³ Mainly based on [CCS guidebooks](#) and interviews with Creative City Solutions and case studies.





Home-owner Association

 **Danish:** *Ejerforening (in this context also applicable to Andelsboligforening)*

 **Dutch:** *Vereniging van Eigenaren (VvE)*

- ⦿ **Primary interest:** Maintaining a financially healthy association, preserving or increasing property values, and keeping monthly owner contributions as low as possible.

Advantages for vertical extension:

- No minimum return on investment required; covering costs and achieving a healthy association balance is sufficient.
- Any revenue from new units can directly offset shared costs such as maintenance and renovation.



 **an example of a project**

where a home-owner association made profits (p. 13)

(Potential) Disadvantages for vertical extension:

- No single decision-maker: agreement from all owners is required, potentially making the early process time-consuming and costly as it often requires professional support to inform and align.
- No direct access to capital; financing is typically at less favourable rates than for professional organisations.
- Limited experience with construction procurement and project management so engaging a professional intermediary is usually needed.



(Institutional) Investor

e.g. pension fund, insurance, real estate fund

- ⦿ **Primary interest:** Achieving stable, long-term, (preferably high) returns on investment.

Advantages for vertical extension:

- Direct access to capital, enabling swift investment decisions.
- Professional organisation accustomed to complex transactions and external advisors.
- Can delegate project management to a specialist intermediary, compensating for limited in-house construction and housing rental/sale expertise.

(Potential) Disadvantages for vertical extension:

- Requires a sufficiently high return, which can be difficult to achieve depending on location, construction costs, and rental/sale market conditions.
- Less intrinsically motivated by social or sustainability outcomes — unless these align with ESG investment criteria, which is increasingly the case.

 **more**

on such intermediary parties (p. 16)



Exploring the business case

Vertical extension is not just an architectural or technical exercise: it needs to make financial sense. This chapter explores when and why the business case works, where it does not, and what this means for policy.

A fictional example for a high-density urban area

The table below presents a fictional example business case using market averages and benchmarks for a dense urban area in the Netherlands, such as Amsterdam. It compares the cost structure of “regular” ground-based new housing with new housing created through vertical extension on top of an existing building.

The example shows that in dense urban areas, vertical extension is economically competitive with “regular” ground-based housing. Even though construction, advisory and contingency costs typically lay higher for vertical extension than for “regular” ground-based construction, this is absorbed thanks to the high sales prices. At the same time the high ground-prices make ground-based construction more expensive as ground prices are typically bid up to compress margins to 20%. In high-value urban areas, where land prices per square metre are exceptionally high, this advantage is decisive. The business case improves further because construction time is shorter reducing financing costs and even further when vertical extension is timed to coincide with planned roof renovation or maintenance works on the existing building.

Fictional example for a dense urban area in the Netherlands (e.g. Amsterdam) ^{4,5}		“Regular” ground-based new housing		New housing through vertical extension on existing building	
	Ground costs ^{6,7}	1.500	€ per m ²	0	€ per m ²
	Construction costs ⁸	2.000	€ per m ²	2.500	€ per m ²
	Advisory costs	350	€ per m ²	550	€ per m ²
	Optional: ⁹ Avoided costs of roof renovation	0	€ per m ²	(-200)	€ per m ²
	Contingency	250	€ per m ²	450	€ per m ²
	Financing costs	500	€ per m ²	400	€ per m ²
	Other costs (permits, infra. contr. etc.)	400	€ per m ²	500	€ per m ²
	Total costs	5.000	€ per m²	4.400 (4.200)	€ per m² <i>incl. avoided cost</i>
	Sales prices ⁷	6.000	€ per m ²	6.000	€ per m ²
	Total income	6.000	€ per m²	6.000	€ per m²
	Balance	1.000	€ per m²	1.600 (1.800)	€ per m² <i>incl. avoided cost</i>
	Margin	20%		27% (43%)	€ per m² <i>incl. avoided cost</i>

⁴ Please note this is a fictional example to show the general cost structure and not predict realistic margins!

⁵ Costs based on verifications with market experts and online sources (e.g. [bouwkostencheck](#) and [NBG](#)).

⁶ Ground prices are typically driven up until profit margins are compressed to roughly 20% in the Netherlands.

⁷ Ground costs and sales prices have been converted from NFA to GFA (factor 0.75) to align with the other development costs which are for GFA.

⁸ According to research construction costs for vertical extensions are on average 25% higher ([EIB, 2024](#))

⁹ If the extension is timed with necessary/planned roof renovation.



Where It Works — and Where It Does Not

Not every location and not every building is suited to vertical extension for new housing. The business case is highly sensitive to two factors: local sale or rental prices, and land costs for conventional alternatives.

In lower-density areas like smaller towns, vertical extension is generally not economically attractive – even if it may provide other benefits. Construction costs for vertical extension are generally higher than for ground-based housing (approximately 25% more on average)¹⁰ due to the technical complexity involved: structural assessments, potential reinforcement of the existing building, and the integration of new installations with existing ones. In locations where sale prices are modest, this cost premium is much harder to absorb. Ground-based development remains cheaper and more straightforward, especially because land prices are relatively affordable.

This creates a clear geographic logic: vertical extension for creating new housing units makes most sense in dense, high-value urban areas where land is scarce, expensive, and increasingly difficult to find. In these locations, the elimination of land costs easily compensates for the higher construction complexity.

Beyond the numbers

The purely financial comparison does not capture the full picture. The true advantages of vertical extension become apparent when we look beyond the numbers. Besides the cost of land, it is simply difficult to find space in dense inner cities. And extending on the outskirts of the city is complicated as it means housing competes for land with agriculture and nature. Furthermore, the limited existing infrastructure and facilities here necessitate more extensive development beyond just housing.

On the other hand, of course not every existing building is suited for vertical extension due to technical constraints, limiting policies, or social concerns. And the technical complexity of vertical extension is higher than “regular” ground-based construction. Then again, with vertical extension construction times are shorter than for “regular” new-build, partly because lightweight timber structures and prefabricated modules can be assembled rapidly on site. This also significantly reduces the ecological footprint per housing unit in addition to avoiding the concrete and steel foundations required for ground-based construction.

Qualitative comparison for dense urban areas such as Amsterdam and Copenhagen			
		“Regular” ground-based new housing	New housing through vertical extension on existing building
	Ground costs	High	None
	Finding suitable locations	Difficult	Difficult
	Spatial integration	More difficult, requires new location	Within existing urban fabric
	Technical complexity	Lower than vertical extension	Higher than “regular” ground-based
	Construction costs	Lower than vertical extension	Higher than “regular” ground-based
	Construction time	Longer than vertical extension	Shorter than “regular” ground-based
	Ecological impact	Higher than vertical extension	Lower than “regular” ground-based
	Return on investment	High due to high sales prices per m²	Higher than “regular” due to no ground costs

¹⁰ EIB (2024) *Meer woningen door verbouw*



Policy Implications

The geographic logic of the business case has a direct implication for policy. Vertical extension works well in dense areas where land is expensive. In these areas, implementation can be increased with the right regulatory environment: streamlined permitting, flexibility in parking requirements, and clear procedures for assessments.

Around smaller cities and towns it is more complicated. Land on the urban fringe and more rural areas remains relatively cheap and ground-based development stays simply more economically attractive. If the ambition is to limit sprawl and preserve the land for nature or agriculture, then market forces alone are unlikely to deliver vertical

extension at scale, as its business case does not close without intervention in less high-density areas. This points to a choice for governments: if both adding housing and nature preservation are genuine policy goals, then active intervention is needed. This could take the form of subsidies or favourable financing for vertical extension projects in locations where the business case is marginal, or stricter regulation of greenfield development that makes sprawl less permissible and densification the default. In practice, a combination of both is likely needed. Without this, the areas where we most want to preserve open land will likely continue to see outward expansion.



Image: Zone Zuid Architects



Example case study 1

Aquarius



Images: ag nova architects



Location:

Amstelveen, Netherlands



Original building typology:

Social housing rental apartments (1970's), concrete foundation



New building typology after vertical extension:

Added mid-segment rental apartments



Period of extension construction:

(2019 start moving residents out)

2021 - 2023 construction and renovation

No. of housing units:

148

Original

+32

New

Building owner:



Social housing association
(Eigen Haard)

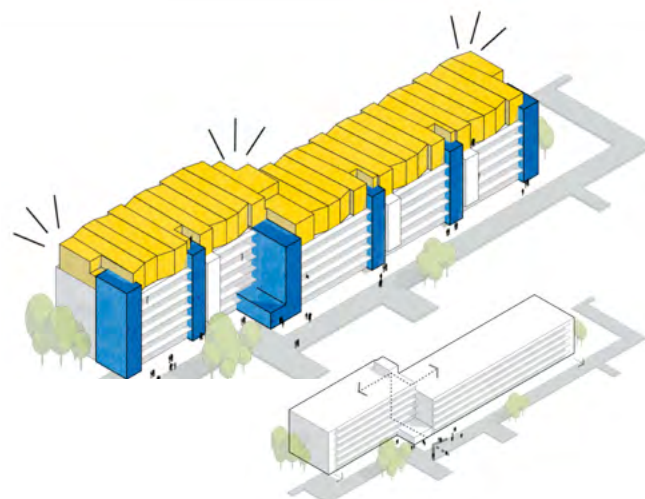
Main material of extension:



Timber

Architect: AG nova architects

Contractor: TBI - ERA Contour



Challenges during the process

- Moving out residents (temporarily) was time consuming and challenging planningwise. Due to the bad state of the complex, residents got urgency status for relocation to other apartments of the housing association and this way it only took 2 years.



Enabling factors in the process

- High urgency for renovation but too little budget, so value addition was necessary to cover the costs and therefore an extension formed a solution.
- Good communication with residents and neighbors during the entire process.
- Clear image-quality plan from the municipality for this neighborhood resulted in a design that received relatively quick approval of the municipal aesthetics board.
- Collaboration with the municipality to improve the surrounding public space (creating a new park) and provide enough parking.
- The creation of studios helped to diversify supply and to lower demand for new parking (studios do not require a parking space by policy).



Relevant links: [ag nova](#), [ERA Contour](#), [Renda](#)

Special thanks to ag nova architects who generously shared their insights and first-hand experience with us — their input has been invaluable for this case study and the guide as a whole.





Images: Creative City Solutions

**Location:**

Amsterdam, Netherlands

**Original building typology:**

Post-war gallery flat (1962), private ownership apartments

**New building typology after vertical extension:**

All new apartments were sale (typology did not change)

**Period of extension construction:**

2023

No. of housing units:

30

Original

+10

New

Building owner:

Home-owner association

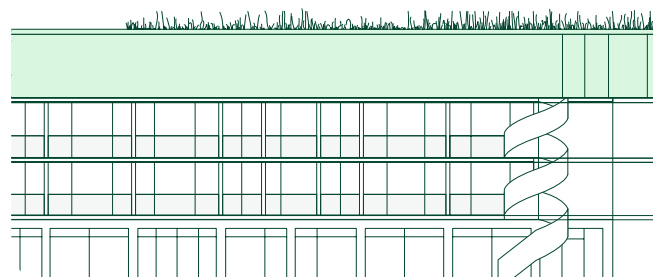
Main material of extension:

Timber construction with brick facade

Partners: Real estate-advisor (Diepenhorst De Vos and Partners), Creative City Solutions (process guidance).

Architect: Kamstra Architecten BNA collaborated with Duyts Bouwconstructies, and EversPartners Engineering.

Contractor: Akor

**Challenges during the process**

- Convince everyone in the home-owners association:
 - » main concern nuisance from construction.
 - » top-floor residents concerns noise from new upstairs neighbors and value reduction of no-longer top-floor apartment.
- Construction took longer than expected, in particular scaffolding was experienced as nuisance by residents.

**Enabling factors in the process**

- Private home-owners association took initiative due to need for renovations (roof and elevator).
- Collaboration with partners to carry investment and risks and have professional support with project management.
- Lightweight timber construction minimized load and disruption.
- Increased safety and accessibility (video-doorbells, new elevator).
- Financially strong business case: Revenue from sales of new homes was reinvested in the building to cover renovations and thanks to revenue excess of €0,3 million (DKK 2,3 million) the monthly service costs of all home-owners could be reduced.

Relevant links: [Creative City Solutions](#), [optoppen](#), [CDN Handbook](#)

Special thanks to Creative City Solutions who generously shared their insights and first-hand experience with us — their input has been invaluable for this case study and the guide as a whole.





Images: Heeswijk Architects

**Location:**

Amsterdam, Netherlands

**Original building typology:**

Five brick housing apartment blocks (1964), rental apartments

**New building typology after vertical extension:**

Two out of five apartment blocks got;

- Two layers on top with 20 rental apartments
- (Side-tower with 19 apartments for sale)

**Period of extension construction:**

(Design phase 1996-1999)

2001 - 2003 construction phase

No. of housing units:**Building owner:**

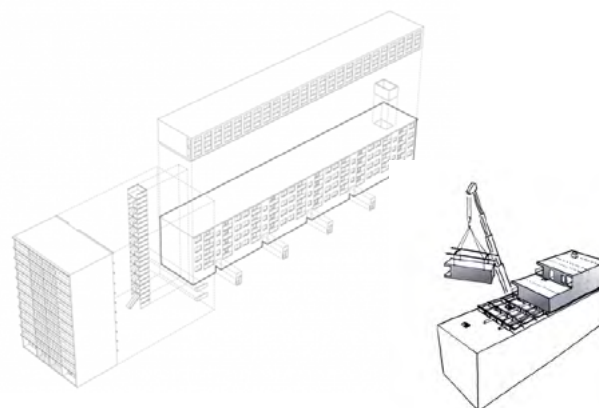
Social housing association
(AWV Amsterdam)

Main material of extension:

Timber frame with flat aluminium cladding

Architect: Van Heeswijk Architecten

Contractor: Moes Bouwbedrijf B.V.

**Challenges during the process**

- Concerns from current residents: 1) nuisance from construction and new upstairs neighbors and 2) reduction of natural daylight entrance due to extensions.
- Aesthetic concerns by the municipality delayed the design process and required a switch to the current architect.
- Initial plan was that the side-towers would help financing renovations but eventually it was the vertical extension that closed the business case.

**Enabling factors in the process**

- Agreement to limit extensions to 2 out of 5 blocks.
- Combining with renovating kitchen and sanitary facilities in all 5 blocks without raising rents to let residents benefit and ensure agreement.
- Accessibility improved with elevators in side-towers.
- Vertical extension with modular timber-frame units was very quick and cost-effective. Reducing construction nuisance and financially enabling renovations.
- Close collaboration with municipality on e.g. parking spaces.



Relevant links: [Hans van Heeswijk, optoppen](#), [Gemeente Amsterdam](#)

Special thanks to van Heeswijk architects who generously shared their insights and first-hand experience with us — their input has been invaluable for this case study and the guide as a whole.





Images: Dura Vermeer

**Location:**

Rotterdam, Netherlands

**Original building typology:**

Senior rental housing complex

**New building typology after vertical extension:**

Unchanged

**Start and completion year of extension construction::**

2023-2024

No. of housing units:

228

Original

+44

New

Building owner:

Housing foundation for elderly (SOR, the largest housing provider for elderly in Rotterdam area)

Main material of extension:

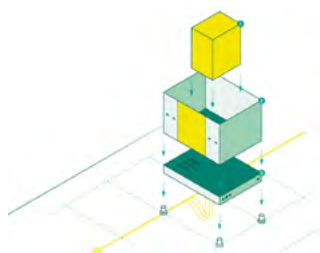
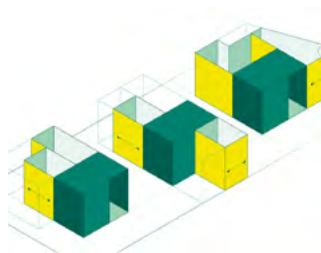
Timber modular prefabricated units

Architect: EGM Architecten**Contractor:** Dura Vermeer**Challenges during the process**

- Undescribed online and unable to interview within the timeframe of this project.

Enabling factors in the process

- Building is owned by elderly housing foundation SOR.
- Social structures: enables aging in same neighborhood and facilitates movement within the community.
- Modular 3D smartbox for utilities (bathroom, kitchen, technical installations) is cost efficient as it is prefabricated and repeated in different context.
- Use of prefabrication and modular construction sped up construction significantly: 4 homes were added per week. It reduces needed labor force on site and significantly reduces disruption for residents.
- Footprint per home is lowered significantly as 55% of materials are biobased.
- Thanks to modular concept, the future sustainability through reuse is guaranteed; 87% disassembly index.



Relevant links: [Blokje Op! Dura Vermeer](#), [Property NL](#), [SOR Bouwt ervoor](#), [Dura Vermeer](#)



The role of an intermediary party

Vertical extension projects involve a complex mix of stakeholder alignment, financial, regulatory, and technical challenges. For many building owners navigating this process alone is a significant barrier, particularly those without in-house construction expertise. An intermediary party can bridge this gap, acting as a connector between building owners on one side and architects, developers, and contractors on the other, while managing the process from feasibility scans through to realisation.

In the Netherlands, parties playing this intermediary role have emerged in response to growing interest in vertical extension. A notable example is [Creative City Solutions](#), a Dutch development and knowledge partner that has built up substantial experience across different building types, extension typologies, and ownership structures. Other parties operating at this scale and diversity are uncommon in the Netherlands. They usually focus either on one specific type of building and extension type or one type of

building-owner, standardizing their methods and approach. Either way, an intermediary party is an interesting model to consider also for Denmark to help scale implementation.

An intermediary party aims to reduce technical, financial and regulatory risk through experience, expertise and a strong network of architects, engineers, contractors and public stakeholders. They act as an independent intermediary between the building owner and the municipality and market parties, clarifying regulations, aligning interests and ensuring technically sound and esthetically fitting solutions. According to the experience of Creative City Solutions a vertical extension is best combined with necessary (sustainability) renovations and can increase the overall property value by more than 13%. Their aim is to reduce doubt and risk and solidify the business case to increase the implementation of vertical extension. Depending on the type of building owner, the intermediary's role looks quite different:

Building owner	Role of the intermediary
 (Social) housing association	• Brings specific vertical extension expertise to complement the association's existing expertise and capacity • Supports in developing the business case and can take on project management.
 Institutional investor	• Quickly makes the business case explicit to assess whether the required return on investment is achievable • Relieves the investor of project management.
 Home-owner association	• Provides intensive early-stage support to inform and align all residents and generate the agreement needed to proceed • Acts as the professional counterpart to the construction sector • Can play a role in financial aspects

What makes this intermediary role particularly valuable is the accumulated knowledge across many projects: familiarity with regulations, financing structures, technical solutions, and the pitfalls to avoid. For building owners embarking on a vertical extension project, this experience and expertise can be the key to making sure a project gets off the ground.



 **an example of a project**

where Creative City Solutions played a role as intermediary for a home-owner association (p. 13)



Dutch lessons learned:

Common challenges and success factors

The Dutch experience with vertical extension across many different projects has resulted in interesting insights. The lessons below have been drawn from case studies across the Netherlands, existing research and best-practice studies, and interviews with architects, developers, and intermediary parties active in the field. While every project is unique, a number of challenges and success factors return more frequently.

Common challenges

Resistance from current residents

A common challenge is worries or opposition from existing residents. Common concerns include construction nuisance during the building process, worries about reduced natural light (particularly for upper-floor residents and neighbors across the building) and noise disturbance (for upper-floor residents that had no upstairs neighbors before). Left unaddressed, these concerns can stall or derail a project entirely.

Technical complexity with installations

A recurring challenge is integrating new installations (heating, ventilation, plumbing, and electrics) with those already in place. In earlier Dutch projects, insufficient attention to the connection of new and existing systems, as well as lack of plans for (unforeseen) future maintenance, led to costly problems down the line. Chimneys and ventilation shafts need to be carefully rerouted to the new roofline, and plumbing and electricity needs extension to the new homes. Possibilities for access for (unforeseen) future maintenance must be thought through from the outset.

How to overcome

The most effective response is to ensure that current residents tangibly benefit from the project. This can include renovations of kitchens, bathrooms, and shared installations; improved insulation that lowers energy bills; upgraded common areas; and improved accessibility through the addition of an elevator. Providing residents with daylight assessments demonstrating the actual impact on their individual home has also proven effective in addressing concerns about daylight. Engaging an experienced intermediary party to guide and facilitate the resident alignment process can be helpful.

A now widely adopted solution is a dedicated intermediate layer between the existing building and the new extension that provides accessible space for all connections. A sort of rooftop “crawl space” that allows access to pipes and cables without having to open up finished floors. This makes future maintenance and adjustments significantly easier and cheaper.

Another recent innovation is the standardised installation cube: a prefabricated 3x3x3 meter unit containing all key installations (fuse boxes, water connections, pipes, cables, and ventilation) around which wet rooms can be designed. The rest of the apartment can be flexibly designed to suit the specific roof and project. Because the cube is standardised, it can be produced efficiently and craned onto the roof as a complete unit, reducing on-site complexity and construction time.



Creative City Solutions has published technical guidelines for construction of vertical extensions that are

freely available 

(They are originally in Dutch but hopefully this will not form a barrier for Danish readers thanks to modern technology)



Common challenges

Conflicting ambitions within local governments

Even where a municipality is broadly supportive, vertical extension projects can get caught between departments with different and sometimes conflicting priorities. Housing, heritage, green space, mobility, and sustainability do not always point in the same direction. Without internal coordination, projects can stall in bureaucratic friction.

Pressure on parking availability

New homes mean new residents, and potentially more cars. Parking can be a significant point of friction, both practically and politically. Standard parking norms can make a project economically unviable by requiring more parking spaces than the location can accommodate or the project can finance.

Regulatory misalignment

Vertical extension projects frequently encounter regulatory hurdles: zoning plans that do not yet accommodate additional storeys, aesthetic committees cautious about changes to the skyline or heritage streetscapes, and biodiversity assessments required before permits can be granted. Each of these can add significant time and cost to a project.

How to overcome

The municipality of Amsterdam has addressed this directly by establishing a dedicated cross-departmental team to coordinate vertical extension and other building transformation projects, reflecting its status as a core element of the city's housing strategy. This kind of institutional alignment, where housing, sustainability, and spatial planning departments work toward shared goals, is a significant enabler, and therefore relevant for other municipalities too.

Successful projects have addressed this by working closely with the municipality to apply **location-specific parking norms** rather than standard figures, and by actively exploring shared mobility solutions and improvements to public transport access. Neighbourhood-specific research into **actual parking behaviour** (rather than generic benchmarks) has helped make the case for more flexible approaches.

Close and early collaboration with the municipality is the most effective way to navigate this. Framing the project in terms of the municipality's own goals (e.g. increasing housing supply, improving sustainability, optimising public space) helps build the internal support needed to find solutions. Working at a neighbourhood scale rather than building by building can also unlock efficiencies: the municipality of Rotterdam, for example, now requires a single biodiversity assessment per area rather than per individual building.

Success Factors

Across successful Dutch projects, a number of factors consistently stand out:



Early and genuine resident involvement — engaging current residents and the wider neighbourhood from the earliest stages, not as an afterthought.



Tangible benefits for existing residents — making sure the project improves the building and living conditions for those already there.



Combining extension with renovation — integrating planned maintenance and sustainability improvements to optimise costs and reduce disruption.



Close municipal collaboration — embedding the project in local policy and regulatory frameworks from the start.



Lightweight, modular, prefabricated construction — reducing construction time, cost, on-site nuisance, and environmental impact.

New Developments Adding Momentum

The conditions for vertical extension in the Netherlands are improving. The national government has developed a dedicated knowledge platform bringing together technical guidance, process documentation, and project examples to support practitioners across the country.¹¹ Alongside this, national subsidy programmes¹² now direct funding to municipalities to stimulate the transformation of existing buildings into housing, including vertical extension, reflecting both the urgency of the housing shortage and the ambition to meet it in a way that is sustainable and less dependent on new land.

These developments signal a gradual shift: vertical extension is moving from an occasional project-by-project effort toward a more structured and supported part of the national housing toolkit.

¹¹ [National housing strategy - tackling housing shortage - vertical extension](#)

¹² [National housing strategy - subsidy scheme transformation housing](#)



Time to build up

The examples and lessons in this guide share one clear message: vertical extension works. It is happening across the Netherlands, and there are examples in Denmark and other European countries too. It delivers new homes without consuming new land, generates value for building owners, lowers construction time and impacts, and improves the quality of life for existing residents. The question is no longer whether vertical extension is possible but what is stopping us from doing it more? The ingredients are there, what is needed now is momentum. Some recommendations based on the Dutch experience:



For building owners: whether you manage a housing association portfolio, represent an institutional investor, or are part of a home-owner association: the opportunity is on your roof. Vertical extension can generate new homes, unlock renovation budgets, and improve your building for everyone in it: better insulation reducing energy bills, a new elevator improving accessibility and enabling ageing in place, an improved façade, and lower shared maintenance costs. Whatever your ownership structure, the starting point is the same: assess your building's potential, investigate the business case for combining vertical extension with sustainability improvements, and make sure all residents are informed and on board from the very beginning. Their support is not just a legal requirement, but it is what makes a project succeed.



For architects and developers: while perhaps more challenging than ground-based development, this is a chance for impactful projects that stand out. There are many examples and guidelines available on the technicalities for different types of buildings and extensions. It is clear though that lightweight, prefabricated, biobased construction methods are advancing rapidly, thereby cutting costs, reducing construction time, and lowering the environmental footprint of every new home built upward. The knowledge is out there - build on it.

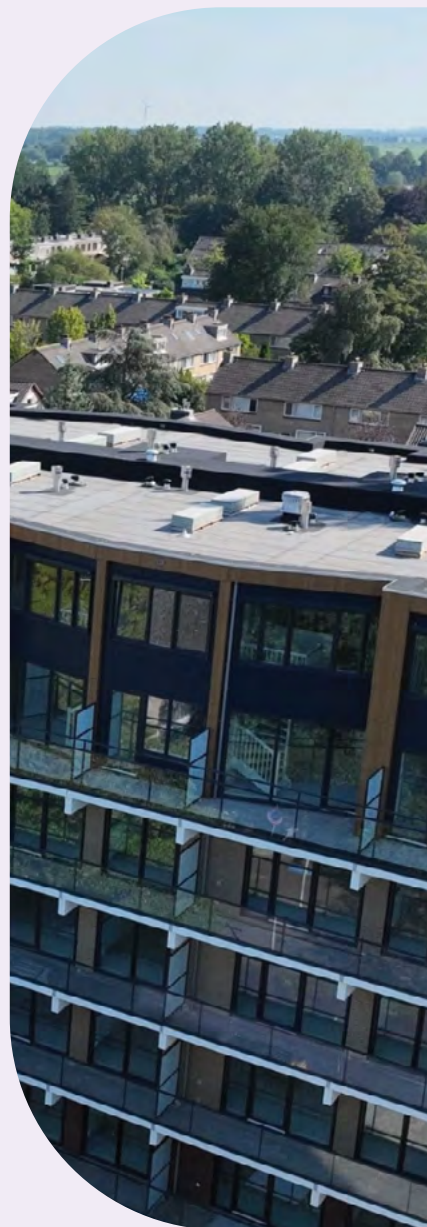
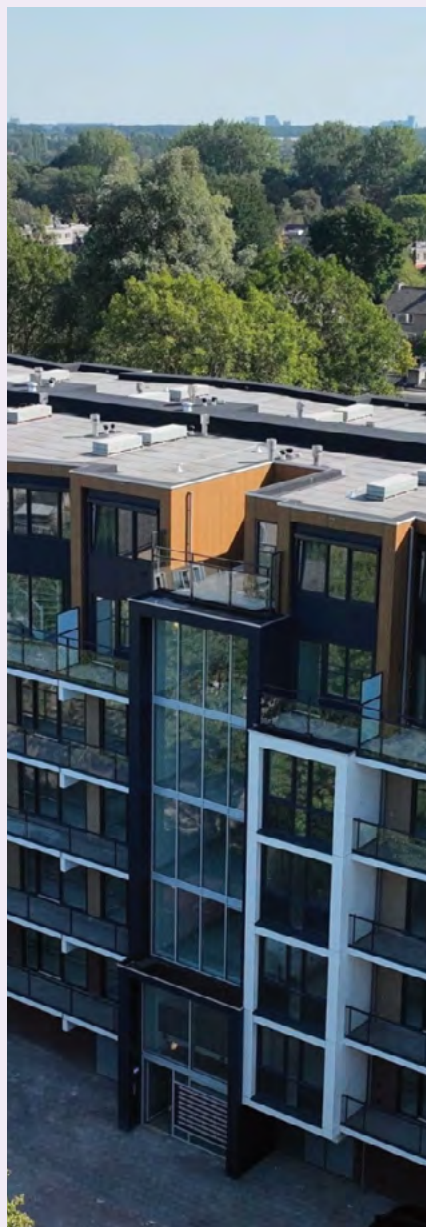


For local governments: the call is clear: align your housing goals with your sustainability goals, and prioritise densification over sprawl - housing does not need to compete with nature by default. Review parking norms that block new homes from being created and dare to work creatively with aesthetic regulations. Consider following the lead of cities like Amsterdam and Rotterdam by actively integrating vertical extension into zoning plans for post-war neighbourhoods, making it a visible part of your housing strategy.

Finally, we believe there is real value in bringing Danish and Dutch stakeholders together directly. Vertical extension is not a foreign concept in Denmark, and it is not a distant ambition. It is already happening and there is more potential. While this guide aims to inspire and convince, another next step to turn inspiration into action could be a study trip to visit completed projects, speak with building owners, architects, and municipalities who have been through the process.

Vertical extension will not solve the housing shortage on its own, but it is a serious, scalable part of the solution. So let's build up!





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Keen to discuss ideas or give feedback on this guide?
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