Circular construction as a strategic answer?

The role of flexibility and remountability in the IFR construction method for making Defense real estate future-proof

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''Die investeringen om altijd maar te blijven aanpassen, dat is nieuw. Dat is echt de toekomst.''

Strategisch adviseur vastgoed MvD

''De markt vraagt vaak hoe flexibel wil je het hebben? Want wat zijn mogelijke scenario's die zich in de toekomst gaan voordoen om te bepalen hoe flexibel het moet zijn? Helaas ontbreekt het vaak aan een helder antwoord vanuit de opdrachtgever.''

Strategisch inkoopadviseur RVB

''Als de grondstoffen steeds schaarser worden, dan maakt het ook niet uit wat de kosten zijn. De kosten halen we er toch wel uit. Het gebrek aan grondstoffen betekent dat circulair bouwen de sleutel is, want anders gaan we dit niet redden.''

Voorzitter programmateam Defensie RVB

Abstract

The strategic management of real estate portfolios has become increasingly complex due to global challenges such as climate change, scarcity of raw materials, and changing organizational needs. For large-scale portfolios, such as those of the Ministry of Defense (MvD), these challenges are increased by strict operational requirements, financial constraints, and sustainability objectives. This thesis examines the role of the IFR construction method as a tool to enhance the flexibility and resilience of large-scale real estate portfolios.

The research follows a qualitative, exploratory approach. The central question is: To what extent does the F(lexibility) and R(emountability) in the IFR construction method provide a solution to the challenges of Defense real estate, such as political and economic fluctuations and increasing sustainability requirements? Interviews revealed that “flexibility” is treated as a broad, complex, and often ambiguous concept, lacking a shared definition among advisors, managers, and needs assessors.

Semi-structured interviews with stakeholders within the Rijksvastgoedbedrijf (RVB) and the Ministry of Defense (MvD) form the core of the data collection. It appears that ‘flexibility’ is interpreted much broader and more complex in practice than the original hypothesis suggested, ranging from product-focused physical adaptability to process-oriented standardization and rapid operational reconfiguration. This diversity exposed a clear gap between strategic ambition and practical implementation.

These insights have led to a reorientation of the literature study and the development of a new conceptual framework that maps the different dimensions of flexibility in relation to portfolio management. The framework places emphasis on the physical adaptability of buildings as a prerequisite for strategic flexibility, while showing that organizational capacity and TCO-based management are essential to unlock real value.

This framework is tested in a focus group to validate its applicability and relevance. The results not only provide a better understanding of the role of F and R in Defense real estate, demonstrating how IFR can offer strategic advantages in cost control, adaptive capacity, and material reuse, but also guide how circular building principles can be strategically employed in response to political, economic, and sustainability challenges. The study highlights that long-term benefits, financial resilience, operational response, and reduced material waste, emerge only when physical flexibility is paired with agile organizational structures and clear strategic vision.

The findings underscore the crucial role of circular building in achieving long-term resilience in real estate portfolios. Ultimately, the research shows that the strategic value of remountable construction depends not merely on flexible building design, but on integrated portfolio governance that embeds flexibility at organizational, process, and product levels.

This thesis contributes to the broader concept of circular economy by demonstrating how circularity can transform real estate management into a strategic instrument for resilience and sustainability.

KEYWORDS

Real Estate Portfolio – CREM – Strategy – Defence – Circular Building Methods – Governmental Real Estate – Flexibility – Adaptability

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1. Introduction

The Dutch Ministry of Defence (hereafter: Defence) faces increasingly complex challenges in finding a balance between operational flexibility, sustainability, and cost efficiency (Algemene Rekenkamer, 2021). In a context of geopolitical uncertainties, where rapid growth of the organization is required, real estate needs fluctuate, and government sustainability requirements increase, the ability to strategically adapt real estate is a welcome principle. Flexibility and resilience play a key role in optimizing costs and ensuring long-term value.

Traditionally, real estate management strategies have been based on linear construction processes, focused on a static cycle of building, using, and disposing (Osslo et al., 2023). Although these methods have been common for decades, they increasingly fall short of meeting the demands of large-scale portfolios that require adaptable, scalable, and resource-efficient solutions. Circular building methods offer an innovative solution to these challenges, addressing both the static nature of real estate and its inefficient use of resources. Methods such as modularity, adaptability, and resource reuse, not only align with broader sustainability goals but can also provide a clear route to achieving the desired flexibility, one of the focal points within Defence's real estate portfolio strategy (Rijksvastgoedbedrijf, 2021).

Defence's real estate portfolio is under increasing pressure. A large portion of the buildings is outdated, inefficient, and poorly maintained, and must be modernized to meet current and future sustainability requirements and needs (Ministry of Defence, 2024). Additionally, traditional construction methods are labor-intensive, slow, and costly, making them unsuitable for the fluctuating operational needs of the ministry (Rijksvastgoedbedrijf, 2024).

A possible solution to this dual challenge seems to lie in the IFR construction method (Industrial, Flexible, Remountable), which Defence has included in their strategy in recent years to accelerate construction production. This method incorporates principles that enable circular building (Rijksvastgoedbedrijf, 2022), but the question remains whether these principles are actually recognized and utilized as a strategic solution to the broader challenges of flexibility and sustainability.

This research starts from the hypothesis that circular building, and specifically the application of flexibility (F) and remountability (R) within the IFR construction method, not only contributes to sustainability but can also function as a strategic tool to make Defence real estate more agile and resilient in light of political and economic uncertainties. While sustainability is a significant driver for the application of the IFR construction method, Defence primarily focuses on accelerating construction processes and realizing financial benefits (Hovens, personal communication, December 9, 2024). However, this research has an exploratory character and is explicitly open to new insights and perspectives that emerge during data collection and analysis.

Despite the potential of circular building methods (such as IFR), their application within large-scale, dynamic portfolios has hardly been researched. Existing literature has established the theoretical benefits of circularity, such as less waste, lower costs, and longer lifespans of buildings (Osslo et al., 2023). However, there is no existing model that succeeds in translating these principles into an approach where flexibility and remountability are considered central outcomes in a real estate

portfolio. Most models approach these concepts from a singular building perspective. Additionally, little research has been conducted on the practical integration of circular building methods within organizational structures, particularly in government portfolios where complex interest fields and changing (geo)political priorities are present.

This research aims to develop a framework that translates the concept of flexibility within circular construction methods into strategic applications in large-scale real estate portfolios. This framework supports the Ministry of Defense in integrating the IFR construction method into its real estate strategy by positioning flexibility not merely as a technical or circular principle, but as a strategic goal. This enables the Ministry of Defense to respond to changing circumstances and make its real estate portfolio more future-proof, in addition to accelerating construction processes and realizing financial benefits. Furthermore, the framework provides insight into the organizational structures and processes necessary to effectively embed flexibility and circularity in the portfolio strategy.

The framework will be tested based on two practical scenarios, evaluated by professionals, to conduct a comparative analysis of the possibilities for utilizing flexibility. This approach yields concrete insights into how IFR construction promotes flexibility and how this aligns with the priorities of involved stakeholders.

The central research question in this study:
How can the IFR construction method contribute to flexibility in the real estate portfolio strategy of the Ministry of Defense?

To answer this question, the following sub-questions will be investigated:

- How is flexibility and remountability interpreted within the RVB and the Ministry of Defense in relation to IFR construction?
- What new insights about flexibility on added value emerge from interviews with experts?
- How can a framework be developed that translates these insights on added value into the portfolio strategy?
- How is the framework experienced by stakeholders in the focus group?

This research specifically focuses on the concept of flexibility within the portfolio strategy of the Ministry of Defense in relation to the application of the IFR construction method. The focus is on the interpretation of flexibility and remountability as experienced by experts within the Ministry of Defense, and on translating these insights into a usable framework to support portfolio strategies.

The research focuses exclusively on qualitative insights and does not include quantitative analysis or financial calculations. The results are based on literature research, expert interviews, and validation with a focus group, with specific attention to the application within the Ministry of Defense of the Netherlands. The legal framework, technical details of the construction method, and aspects such as sustainability are outside the scope of this research.

The outcomes are intended as an initial exploration and do not provide generic recommendations for other organizations outside of Defense, although the insights may also be relevant for similar real estate issues within the public sector.

2. Research Method and Approach

Goals and Objectives

The primary goal of this research is to define the concept of flexibility in the portfolio strategy of Defense. This study tries to bridge the gap between theoretical insights and practical application, emphasizing how circular principles from the IFR construction can enhance spatial, financial, and operational flexibility. The assumption is that by pragmatically employing such circular construction methods for flexibility, buildings can respond to a changing organization.

The specific objectives include: defining flexibility within the portfolio strategy of Defense using the IFR construction method, designing a framework that aligns with the strategic priorities of asset management, facility management, and cost control, integrating stakeholder perspectives to ensure that the framework is practically applicable and addresses real challenges, applying the framework to practical scenarios to obtain useful insights and demonstrate its relevance and effectiveness, and providing evidence-based recommendations to advisors, policymakers, and practitioners for effective integration of flexibility through IFR construction in their real estate portfolios.

Deliverables

The main end products of this research include the framework, a validated tool for determining flexibility in the real estate portfolio. The research will also produce a scenario analysis that provides comparative insights from two cases where the flexibility concept is applied as defined. This thesis brings together the conceptual and practical findings and conducts an analysis. A summary of stakeholder feedback will capture the priorities, challenges, and insights gathered through interviews and the focus group. Practical recommendations will be made to address the implementation of the flexibility concept in large-scale portfolios.

Dissemination and Audiences

The dissemination of research findings will primarily target the Rijksvastgoedbedrijf to ensure that relevant stakeholders are reached. Other professional stakeholders, such as the Ministry of Defense, including policymakers, asset managers, and facility managers, will also receive the key outcomes, such as the framework and practical recommendations.

Data Plan and Ethical Considerations

The research has produced various types of data, including interview recordings and transcripts, documents, and recordings from the Focus Group. All data concerning human participants were collected with their informed consent. Participants received information about the objectives of the research, the intended use of their contributions, and their rights throughout the research process. Participation was entirely voluntary; participants could refuse to participate or withdraw their contributions at any time without giving a reason. Efforts have been made to ensure that all collected data remains anonymous and confidential. Identifiable information has been removed or anonymized from the final dataset and publications to protect the identity and privacy of participants.

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All data will be securely stored on the encrypted servers of the Rijksvastgoedbedrijf. Access to the raw data will be strictly limited to the researcher and the supervising team, safeguarded by access controls to prevent unauthorized use. Any physical documents, such as printed materials, will be kept in secure storage. Interview transcripts will be anonymized, with sensitive or commercially confidential information excluded during analysis. The data will be systematically examined, and upon completion of the thesis, all raw data will be deleted. Only anonymized transcripts will be retained for potential verification purposes.

The final thesis will be made publicly accessible through the repository of the Delft University of Technology. Anonymized datasets may be shared with collaborators or for academic purposes under strict agreements regarding data sharing. Sensitive information related to Defense operations or confidential project details will not be included in publicly shared materials to comply with the organization's confidentiality requirements.

3. Conceptual model

The conceptual model offers a schematic representation of the expected relationships among the core concepts in this research. The model visualizes how the application of the IFR construction method at Defense contributes to achieving flexibility and remountability in the real estate portfolio, and how these properties in turn influence the strategic portfolio strategy and its added value.

The model provides an overview of the relations between IFR construction and the concepts of flexibility and remountability. At the top of the model, these relationships are made visible through the first two sub-questions of this research:

- How is flexibility and remountability interpreted within the RVB and the Ministry of Defense in relation to IFR construction?
- What new insights about flexibility on added value emerge from interviews with experts?

The lower part of the model focuses on translating these insights into practical applications and determining their impact and added value. This is shaped by the last two sub-questions:

- How can a framework be developed that translates these insights on added value into the portfolio strategy?
- How is the framework experienced by stakeholders in the focus group?

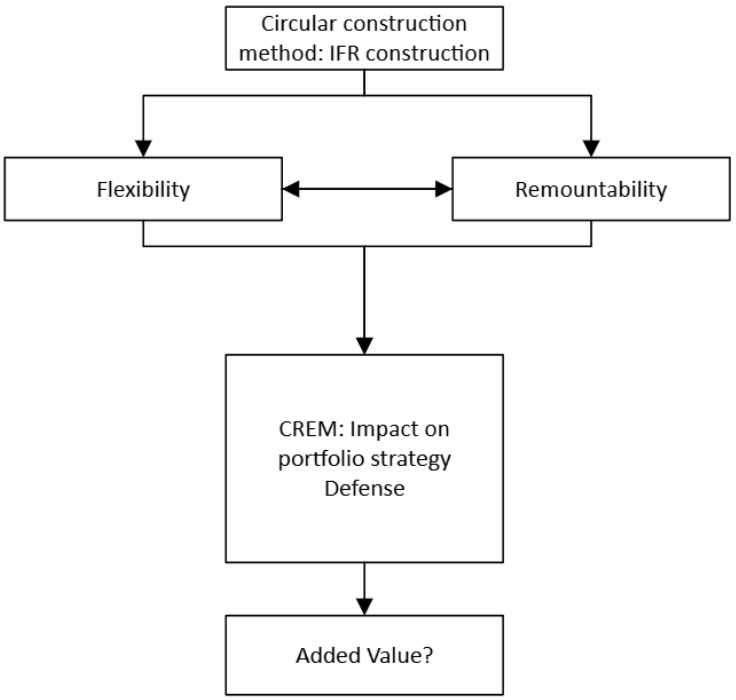


Figure 1: Conceptual Model Thesis

4. Research Design and Methods

Research Design

The research is an exploratory qualitative study to define the flexibility concept of the IFR construction method in the portfolio strategy of Defense. The research is structured into three interconnected parts, with each step contributing to both the conceptual foundation and the practical applicability of the flexibility concept. This research design is common for topics that are still little known in the literature (Blaikie & Priest, 2019).

The central goal of this research is to explore and define the concept of flexibility within the real estate portfolio of Defense, focusing on developing a strategic interpretation of this concept. Within the Rijksvastgoedbedrijf and Defense, there is currently insufficient insight into this concept at a strategic level. At the same time, there is interest, particularly because the implementation of the IFR construction method in the real estate strategy provides an opportunity to further investigate the potential added value in terms of cost and time savings.

The research takes place within the organization of the Rijksvastgoedbedrijf and Defense and consists of two components: on one hand, a field research on the definition of flexibility in a real estate portfolio (considering the IFR building method) and the practical implementation of this within the complex and large organizations of the Rijksvastgoedbedrijf and Defense, and on the other hand, a desk research, where the insights gained are placed within the context of existing literature in the form of a framework. A validating focus group can provide insight into whether the chosen approach to the concept of flexibility is indeed of added value for the portfolio strategy. The design is represented in the diagram below.

Here, two points are designated for reflection on the hypothesis of this research. Following the interviews, an addition has been made during the course of the research.

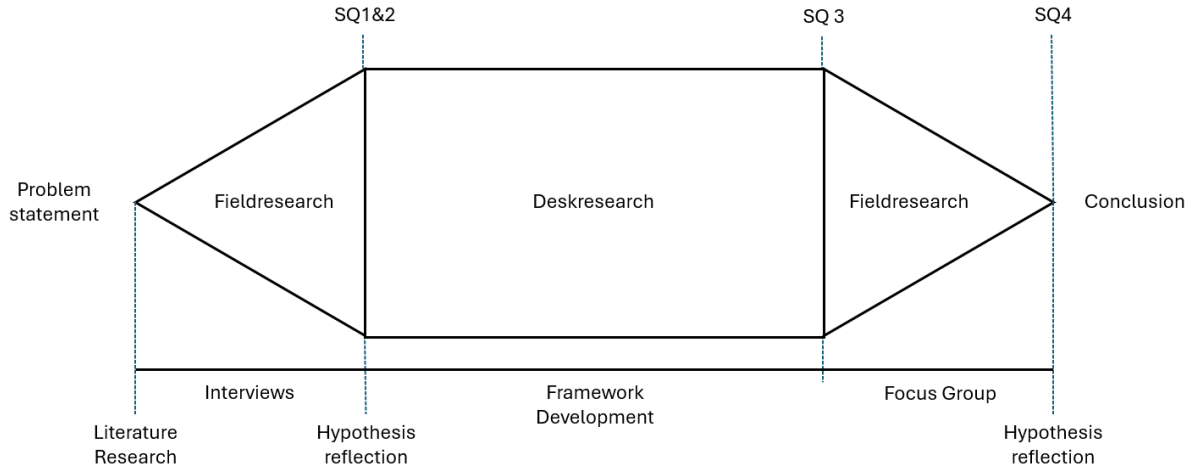


Figure 2: Research Design Thesis

Field research

The interviews are conducted with experts within the Rijksvastgoedbedrijf and Defense, roughly distinguishing between advisors, managers, and needs assessors. By gathering these different

perspectives, a broad picture of the concept of flexibility and its possible interpretations within the organizations emerges.

The practical implementation of the concept of flexibility is then tested in a focus group, in which advisors and managers participate.

Desk research
To translate the input from the experts into a usable interpretation of the concept of flexibility, a desk research is conducted. This research helps to clarify the interrelationships and further develop the topics that the experts provide. The interviews yield a wealth of knowledge, experiences, and interests that need to be structured and substantiated. By studying literature, the proposed concepts, ideas, and interpretations are further examined and contextualized. The insights from these two tracks (interviews and literature) are brought together in a coherent framework. This framework provides structure and substantiation for the concept of flexibility and serves as a basis for the validation of the strategic deployment of flexibility within the portfolio strategy of Defense in the focus group.

Research Methods

Literature research
The literature review aims to establish a foundation for the research by exploring and defining the core concepts central to the study. These concepts provide a framework for understanding the broader academic and practical landscape, guiding the theoretical approach of the research. The study examines existing literature to identify connections and shortcomings, pool knowledge and provide clarity on the central themes being explored.

Various search terms and combinations have been drawn up for the literature study based on the core concepts from the research. Searches were conducted in 'Google Scholar' and the 'TU Delft Library' to identify a range of relevant literature. Since the Rijksvastgoedbedrijf views IFR construction itself as a circular building method (Rijksvastgoedbedrijf, 2022), the literature review specifically searched for terms related to circular building as an interpretative framework for IFR construction. Scientific studies that explicitly use the term IFR construction are not available. The search terms have been grouped into the following themes: Flexibility, Remountability and Strategic Real Estate Management. The search terms within these themes are composed as follows:

- Flexibility: 'Building Flexibility' U 'Portfolio Flexibility' U 'Flexibility in the Built Environment'
- Remountability: 'Remountable Buildings' U 'Reversible Building Design' U 'Circular Construction' U 'Circular Building Design'
- Strategic Real Estate Management: 'Strategic Asset Management' U 'Portfolio Strategy' U 'CREM Strategy' U 'real-estate portfolio management' U 'Value Creation' U 'Circular Economy'

A more in-depth literature review resulted from the interviews. During these discussions, new insights and interpretations regarding the concept of flexibility within the real estate portfolio were revealed, leading to further theoretical deepening. This has resulted in a refinement of the hypothesis, as visually shown in figure 2. This relates to the theme of *adaptability*.

The approach started broadly, with search terms related to general adaptability in the construction and real estate sector. Gradually, this search was refined towards more specific combinations of adaptability and portfolio management. 'Google Scholar' was used to find relevant literature. Combinations of the following search terms were used:

- Flexibility: 'Building Adaptivity' U 'Portfolio Adaptivity' U 'Adaptive Capacity' U 'Design for Adaptability' U 'Design for Disassembly' U 'Building Component Reuse'
- Portfolio Management: 'TCO' U 'Value' U 'Value Creation'

All search queries were combined to identify the overlap between themes, for example, to investigate the relationship between flexibility and remountability in strategic real estate management. When searching for the overlap of themes, this yielded limited results. Similarly, with flexibility as an individual search theme. This indicates that the theme has been little researched in this specific context. Most relevant literature was found in combinations of two or three themes, which contributed to the formulation of the literature study.

The selection criteria for relevant literature were:

- The applicability in the context of strategic real estate management within public or complex organizations.
- The degree to which an article provides conceptual or theoretical frameworks around adaptability and/or value creation.

The primary literature consists of papers and books that offer theoretical frameworks on the examined themes:

- The principles of remountability and circular building have been investigated based on literature on circular construction methods, including the work of Osslo et al. (2023), De Graaf & Schuitemaker (2022), Vos (2020), and Brand (1995).
- For strategic real estate management and portfolio strategy, the work of Global (2015), Joroff et al. (1993), Weatherhead (1998), Putte & Jylhä (2022), Krumm et al. (2000), and Den Heijer (2011) has been utilized, which is reflected in CREM as a literature theme. And Gibson (2001) presents a tripartite division of real estate in the portfolio into core real estate, supporting real estate, and flexible shells around the core, as a basis for strategic ownership and flexibility. To clarify the rationale for using a flexible asset, the work of Schneider and Hill (2007) is referenced.
- Geraedts et al. (2014 & 2016) for definitions and design principles of adaptive capacity in buildings. These form the basis for the interpretation of flexibility within the research.
- Volberda (1997) provides strategic-organizational insights on adaptability and organizational agility, relevant for portfolio approaches at a strategic level.
- Ellram (1994) offers theoretical foundations on Total Cost of Ownership (TCO), which help to connect financial and value-driven management to flexibility strategies.

During the literature study, sources were also found that seemed relevant but proved unusable for the theoretical framework of this research. For instance, some articles on modular construction techniques, enabling circular material and product flows in construction, and the reuse of building components in relation to economic value were not included. These sources primarily focus on

construction technical or product-oriented optimizations and do not delve into the strategic management of flexibility within real estate portfolios. Additionally, sources that limit flexibility at the building level to merely functional or technical adjustments were not included, as this research focuses (initially) on flexibility as a strategic tool at the portfolio level.

This chapter further explores the literature behind the concepts that drive the research. This study has two broad perspectives on the concept of 'flexibility', one from circular construction methods and the other from real estate portfolio management (CREM).

Semistructured expert interviews

For this research, fifteen semistructured interviews were conducted with experts in the real estate sector of Defense. Eleven of the interviewees are experts recommended by the team leader of the Defense team within the Rijksvastgoedbedrijf, who is also the main initiator of the real estate strategy using the IFR construction method. Additionally, extra experts were involved to gain a broader perspective on the subject, both at the operational and policy levels.

The interviewees are divided into three groups: advisors (8), managers (3), and needs assessors (4). The advisors hold various positions, most of whom (5) work at the Rijksvastgoedbedrijf. Their expertise includes sustainability, circularity, climate adaptation, strategic procurement, programs, and Defense programs. From Defense, there are advisors involved with roles in relationship management, portfolio strategy, and real estate consulting.

The three managers are: the chair of the Defense program team, the former head of program management, and the director of real estate transformation within the Directorate-General for Policy.

Finally, four needs assessors were interviewed, all working within Defense. This includes the assessors for the army and air force, the manager of all needs assessments, and a project leader from the Military Police.

The transcribed interviews were analyzed on main themes: the meaning, necessity, added value, level, and risks of flexibility within the Defense portfolio. Within each theme, distinctions were made between the three involved groups. Based on this, a synthesis is made that elaborated on the differences and similarities between these groups.

Focus Group

The purpose of the Focus Group was to test the defined concept of flexibility within the portfolio strategy of Defense, based on two practice-oriented example scenarios. Thus, the session served as a validating step in the research, where the theoretical insights from interviews and literature research were contextualized with the involved experts.

A total of nine experts participated in the session. The composition consisted of six previously interviewed experts, supplemented by three new participants in managerial positions within the Rijksvastgoedbedrijf and Defense, who could contribute to the discussion with a fresh, objective perspective.

The organization proceeded as follows: all eleven interviewed experts were invited via email approximately four weeks prior to the session. Ultimately, six of them accepted the invitation. A week

before the meeting, an explanatory attachment was sent containing a summary of the research results up to that point, including the conceptual framework that positions the concept of flexibility. Participants were asked to review these documents in advance and provide any objections, additions, or substantive comments prior to the session, in order to reach a shared assessment moment.

The Focus Group took place on May 7, 2025, in a meeting room of the Rijksvastgoedbedrijf in Utrecht and lasted about four hours. The session started with an extensive explanation by the researcher on the developed framework, the core concepts, and the purpose of the validation. Subsequently, participants collaboratively worked on two predefined practical scenarios that are representative of current real estate issues within the Ministry of Defense, such as a change of function for a military base and the relocation of military base buildings due to environmental risks.

The participants were asked to review these scenarios and, based on the presented concept of flexibility, to arrive at a joint action perspective. During the group discussion, the researcher only intervened when participants deviated from the discussed framework or when clarification was needed on parts of the framework. The rest of the conversation proceeded freely, allowing for reflection, discussion, and exchange of insights.

The group discussion was recorded (audio), after which the main contributions and conclusions were extracted. These findings were then systematically compared with the earlier definitions and theories, serving as a basis for refining the final answer to the main research question. Specific attention was paid to the extent to which the concepts were deemed practically applicable, what objections were raised, and where additions were needed to make the concept of flexibility workable in policy terms.

5. Literature Review

This chapter explores the existing literature with the aim of laying a theoretical foundation for this research. By defining and elucidating the central concepts, direction is given to the further analysis, and the broader academic theory is mapped out. First, the strategic real estate management is discussed, followed by flexibility in real estate portfolios, circular construction methods, and finally the theme of adaptability. The chapter concludes with a summary presenting a global definition of flexibility based on this literature.

Strategic Real Estate Management (CREM)

Corporate Real Estate Management (CREM) is defined as the management of an organization's real estate portfolio, aligning the assets and associated services with the core needs of the organization to create maximum value and improve overall organizational performance. CREM encompasses all physical properties, including buildings and workplaces, and involves the strategic, tactical, and operational management of these assets, closely linked with workplace management and facilities management (FM) (Joroff et al., 1993).

The flexibility of an organization and its real estate portfolio largely determines sustainability, economic efficiency, and the ability to respond to changing market conditions and user needs (Global, 2015). This paragraph first explains the CREM Model and then its added value.

CREM Model

Historically, real estate was considered a passive financial asset, but the real estate crisis of the 1990s revealed inefficiencies such as surplus properties and outdated designs that could not be moved. This led to a shift in perspective, viewing real estate as a strategic resource essential for business operations. Real estate contributes to organizational goals, stimulates new work forms, and promotes sustainability (Weatherhead, 1998).

The Delft CREM model, also known as the four-quadrant model (see figure 3), serves as a tool to describe and understand the position of the Corporate Real Estate Manager (CREM) within an organization. The model conceptualizes the CREM function as a coordinator of four different perspectives on corporate real estate and provides a framework to structure information and identify potential blind spots in decision-making (Putte & Jylhä, 2022).

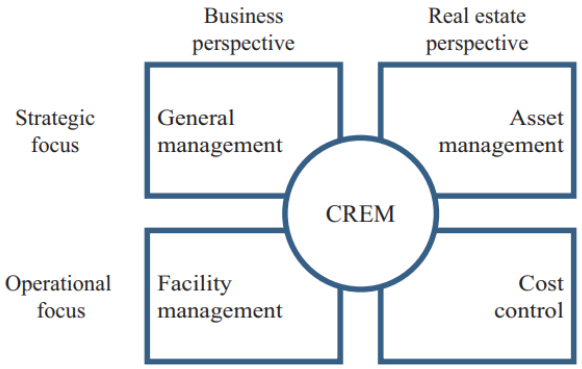


Figure 3: Krumm et al. (2000)

The primary goal of the Delft CREM model is to clarify the role of the CREM manager and to organize the different perspectives on corporate real estate within an organization. By structuring these perspectives, the model helps to provide insight into how different organizations priorities converge in real estate decisions. At its core, the model positions the CREM function in the center of four quadrants, each representing a distinct perspective. These perspectives have evolved over time, with one of the most well-known versions (Krumm et al., 2000) emphasizing facility management, cost control, general management, and asset management. These are organized along two axes: strategic versus operational and business operations versus real estate.

Two key thoughts underpin the model. The first focuses on the positioning of corporate real estate within the broader organization, emphasizing the alignment between real estate resources and organizational objectives. The second examines the internal activities of the CREM department, highlighting the role of the CREM manager as a coordinator (Putte & Jylhä, 2022).

Modern CREM practices reflect several significant paradigm shifts, such as viewing real estate as a strategic business asset rather than a financial one, designing workplaces as ecosystems that support various work styles, utilizing data-driven decision-making, and creating flexible portfolios that adapt to changing employee needs (Global, 2015). By applying this framework, CREM helps organizations professionalize real estate management, align strategies with business goals, and meet the needs of stakeholders, clients, and society.

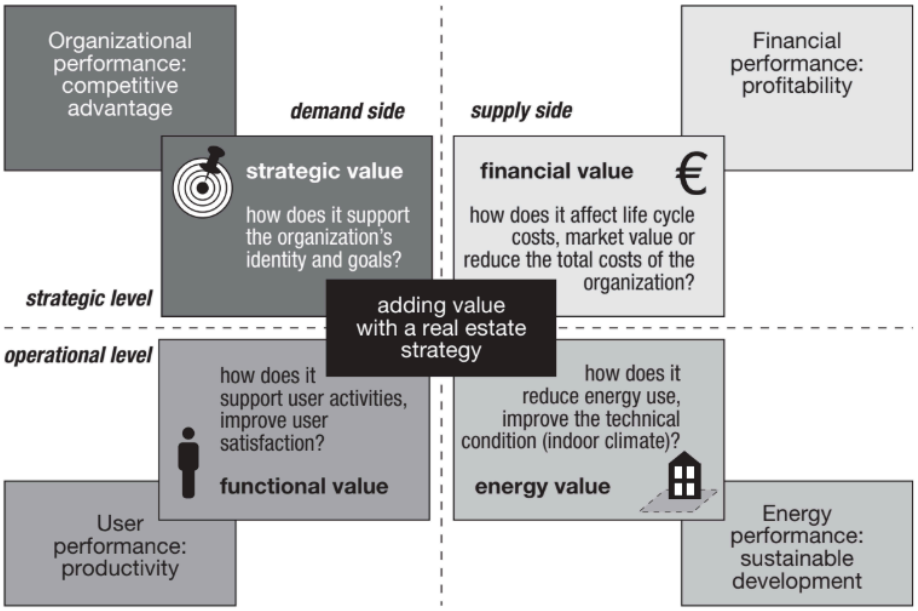


Figure 4: Four types of stakeholders in relation to different types of added value (Den Heijer, 2011)

CREM Values

The framework by Den Heijer (2011) (from Jensen & Van der Voort, 2016, P.38) (see figure 4) provides a framework for understanding and integrating the different dimensions of value creation within

CREM. Within CREM, four main types of stakeholders can be distinguished, each representing a specific form of value:

- *Strategic Value* - Policymakers, such as management and middle management, look at the strategic value of real estate. This means that real estate is seen as a means to support the identity and objectives of the organization. A well-thought-out real estate strategy can provide a competitive advantage, contribute to the organization's positioning in the market, and increase flexibility to respond to future developments.
- *Financial Value* - Financial controllers focus on the cost-effectiveness of real estate interventions. Their primary concern is how real estate can contribute to cost reduction and financial efficiency within the organization. This can be achieved through optimizing the real estate portfolio, reducing operational costs, or finding flexible rental and leasing arrangements.
- *Use Value* - The end-users of the real estate, such as employees and clients, value the functionality, usability, and experiential value of a building. Use value relates to how real estate contributes to the productivity, satisfaction, and well-being of users. Aspects such as indoor climate, spatial design, ergonomics, and accessibility play an important role in this. A well-aligned real estate strategy can enhance employee enjoyment and performance.
- *Energy value* - Technical managers are responsible for the technical conditions of the real estate and are linked to energy value. This concerns not only the energy consumption of a building but also the technical sustainability and the impact of the real estate on the environment. Optimizing energy value can result in lower operational costs, a reduction in the ecological footprint, and an improved indoor climate for users. Sustainability and circular principles play an increasingly important role in this.

Real estate portfolios and flexibility

Gibson (2001) provides a structure for real estate portfolios by dividing flexibility into three dimensions: physical, functional, and financial. Physical flexibility concerns adjustments to structural or technical elements such as layouts and installations. Functional flexibility relates to the ability to respond to changing workplace models. Financial flexibility revolves around managing financial risks, for example through renegotiation or termination of contracts.

Gibson also introduces the core-periphery model (figure 6), which is applicable to real estate portfolios. This model distinguishes between core assets, which require long-term stability and functional flexibility, and peripheral assets, where financial agility is central. Core assets such as headquarters or R&D facilities support crucial business activities and demand structural stability. Peripheral assets, on the other hand, provide space for rapid adaptation to changing space demands.

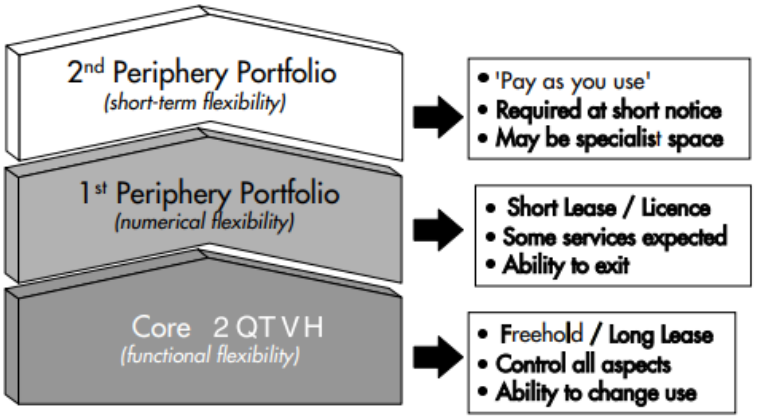


Figure 6: The core –periphery property portfolio (Gibson, 2001)

Flexibility in CREM

Flexibility within Corporate Real Estate Management (CREM) is a concept defined from perspectives that emphasize both strategic adaptability and practical execution. The original definition considers flexibility as the ability to adjust real estate assets and operations to a changing business environment, external market conditions, and unforeseen events (Global, 2015). Schneider and Hill (2007) elaborate on this, stating that flexibility enables real estate to adapt to changing needs influenced by demographic, economic, and ecological trends.

Flexibility in CREM is essential for supporting long-term organizational resilience and responding to market developments (Global, 2015). This adaptability is becoming increasingly important but also more complex in the context of circular real estate strategies, where modular design, deconstruction, and reuse are central to maintaining the value of materials and spaces in the long term. Ultimately, flexibility provides organizations with the agility needed to respond to changes in demand, regulations, and environmental objectives, ensuring that real estate portfolios remain efficient and sustainable (Global, 2015).

Circular construction methods

Circular construction methods primarily focus on minimizing waste and maximizing the value of materials and resources throughout the entire lifecycle of a building. This contrasts with the traditional linear economy of "take, make, dispose" (Osslo et al., 2023). Central models in the theory of circular building include the R-ladder and the 6S model. Through these models, emphasis is placed on designing buildings for long-term flexibility. This is achieved through the idea of adaptability and reuse (De Graaf & Schuitemaker, 2022). As a result, components can be replaced, updated, or repurposed without disrupting the entire structure.

Circular construction methods have been extensively developed in recent years and, in this context, possess at least the characteristics described in this chapter. In relation to the circular economy, the R-ladder is first described, followed by the 6S model.

R-Ladder

Central to circular building is the R-ladder, a hierarchy of 'strategies' aimed at keeping materials and products in use for as long as possible (Vos, 2020). These strategies include refusing unnecessary

materials, reducing raw material usage, reusing products, repairing and refurbishing to extend the lifespan of products, recycling materials, recovering energy from waste, and replacing non-renewable materials with renewable or biobased alternatives.

Using a material passport, a digital tool to monitor value and properties, circular buildings can be guided based on the R-ladder. It is these principles that support a broader range of strategies, such as designing for future adaptability, applying renewable and non-toxic materials, and reconsidering business models to stimulate long-term value creation, such as the product-as-a-service model (Vos, 2020).

Figure 2 shows the well-known broader interpretation of the R-ladder in the circular economy, where the flows are visually represented.

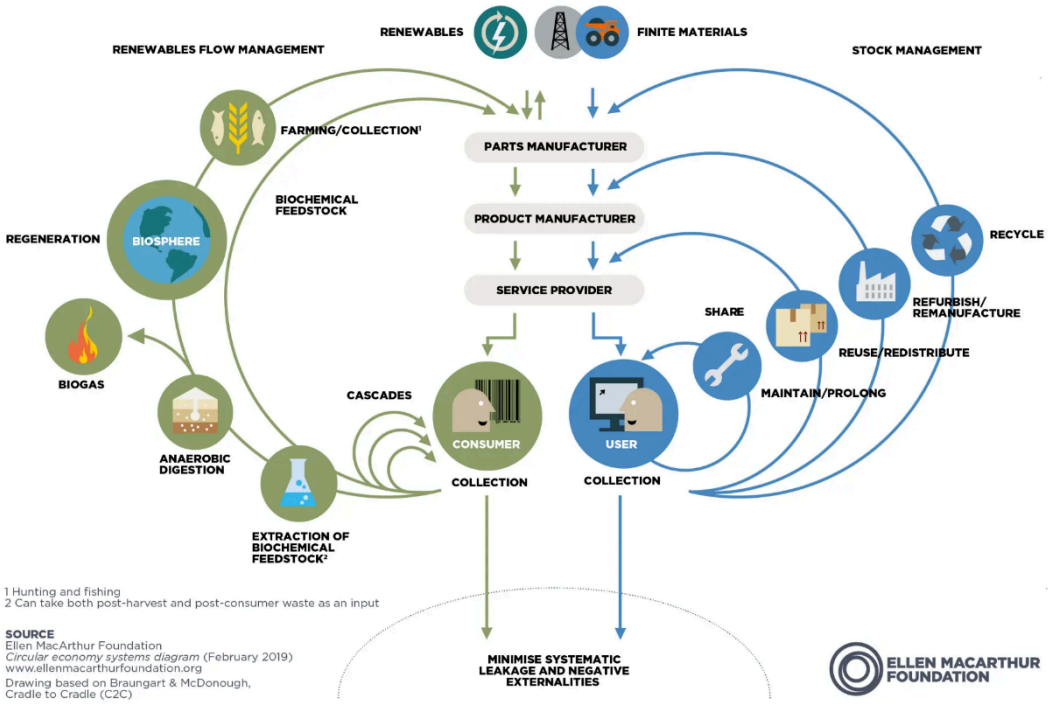


Figure 2: The Circular Economy in Detail, (Ellen MacArthur Foundation, 2019)

6s model

The 6S model, an essential framework within circular building, emphasizes that different components of a building have varying lifespans. This presents opportunities to integrate flexibility and extend the overall lifecycle of the building. This model, developed based on the work of Frank Duffy and further elaborated by Stewart Brand (1995), divides a building into six layers:

- Stuff (5–15 years): Movable elements such as furniture and fixtures.
- Space Plan (5–20 years): Layout and partitioning of the interior space.
- Services (5–30 years): Technical installations such as HVAC, plumbing, and electrical systems.
- *Skin (30–60 years)*: The building envelope, including facade and roof.
- Structure (60–200 years): The load-bearing structure of the building.

- Site (>200 years): The location and surrounding environment.

Within circular construction, a distinction can be made between the use of reused materials in new buildings and the design of buildings that facilitate reuse in the future. The former focuses on reducing waste by repurposing existing materials, which has a direct circular impact. The latter approaches circularity in the long term by designing building systems and materials in such a way that they can be easily disassembled and reused when a building is modified or dismantled. This latter approach not only adds value to the building itself but also enables a more sustainable and flexible use of materials in the future. This study focuses on this second approach.

Adaptability

Flex 4.0 framework

Flex 4.0 (Geraedts, 2016) is a tool developed to assess the physical adaptive capacity of buildings. This tool makes the flexibility of buildings measurable and understandable. Flexibility in this sense is the ability to adapt to changing circumstances. It thus provides a direct link between adaptive building and circularity, namely keeping the real estate operational for as long as possible. At the building level, the underlying idea is that real estate can easily adapt to changing user demands and market conditions, thereby extending their functional lifecycle and making them more sustainable.

The assessment tool contains 44 flexibility performance indicators with corresponding assessment values. These indicators provide insight into the degree of flexibility that a building offers.

Another fundamental aspect of Flex 4.0 is the integration of Habraken's theory. This means that the tool distinguishes between generally applicable flexibility indicators (the 'support') and more specific indicators that are relevant to different types of real estate (the 'infill') (Habraken, 1972, as cited in Geraedts, 2016). This allows for a more targeted measurement and optimization of flexibility based on the type of building and specific usage needs.

An important framework within Flex 4.0 is the previously described '6s model', which structures the physical components of a building into the six aforementioned categories. This classification is explicitly used in Flex 4.0 under the term 'layers with different lifecycles'.

Within this model, it is guided that each layer has its own technical, functional, and economic lifespan. The structure of the 6s model supports Flex 4.0 in organizing and clustering the various building components based on their functional lifespan. Through this approach, the Flex 4.0 tool makes flexibility measurable and understandable, with the possibility of reuse, which aligns with the principles of circular construction.

Adaptive Capacity in CREM

The establishment of flexible real estate is approached at different levels. The starting point here is adaptive capacity. This consists of organizational, process, and product flexibility, according to Geraedts et al. (2014), (from Jensen & Van der Voort, 2016, P.161) (see figure 4). Organizational flexibility refers to the adaptability of an organization to respond adequately to changing demands in the built environment. This includes strategic, structural, and operational flexibility. Strategic flexibility enables an organization to adapt to external factors such as technological innovations, economic fluctuations, and changing regulations. Structural flexibility means that an organization can adjust its internal processes and collaborations to better respond to changing circumstances, such as through the deployment of multifunctional teams or flexible collaboration models with suppliers.

Operational flexibility relates to practical adjustments within the organization, such as managing inventory, employing temporary staff, or reserving production capacity with suppliers.
The goal is to develop real estate that facilitates agile operations and strategic restructuring. Organizational flexibility means control over the organization, or sufficient management capacity to respond adequately to changes (Volberda, 1997). In a stable environment, flexibility is less relevant, but for organizations in a turbulent context, it is essential.
To achieve this, there must be a balance between the responsiveness of the organization and the dynamic control capacity of management. Data-driven operations are crucial in this regard; the type of data varies depending on the nature of the change, which requires flexibility in data usage.
For a flexible real estate strategy, management based on Total Cost of Ownership (TCO) is necessary. TCO is an approach that makes all costs associated with the realization and use of real estate transparent. Instead of focusing solely on the initial investment, TCO also considers additional costs, such as maintenance, usage, risks, and depreciation. This broader perspective provides a more complete picture of the actual financial impact and helps in making better-informed investment decisions (Ellram, 1994).

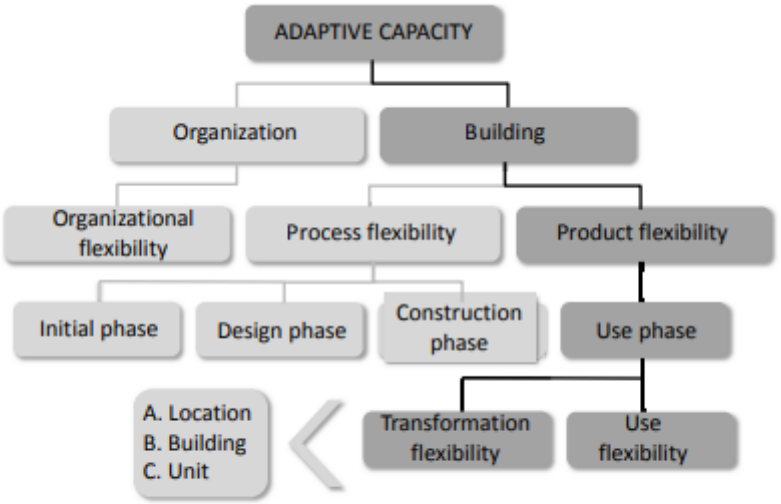


Figure 4: Different aspects of adaptive capacity and the focus within this chapter (marked dark) (Geraedts et al, 2014)

In addition to organizational flexibility, a distinction is made within real estate management between process flexibility and product flexibility. Process flexibility relates to the ability of a construction process to respond to changing circumstances and wishes during the initiation, design, and construction phases. This includes both planned flexibility and responsive flexibility to allow adjustments in design or construction without significant delays or cost increases.
Product flexibility, on the other hand, focuses on the adaptability of a building during the usage phase, where changes can be implemented without complex and costly technical interventions (from Jensen & Van der Voort, 2016, P.161). This can relate to the following dynamics (Geraedts et al., 2014 from Jensen & Van der Voort, 2016, P.167):

- Reallocate: The extent to which a building can be reallocated or redesigned to meet new user requirements.
- Grain size: The extent to which the number of users of a building can increase or decrease.

- Facilities: The extent to which the facilities can change within and/or outside the building.
- Quality: The extent to which the finish can be upgraded per user unit or building.
- Expansion: The ability to expand a building to meet changing space demands.
- Rejection: The extent to which a building can be disposed of when it is no longer profitable within the portfolio.
- Transfer: The extent to which a building can be relocated to another site.

These dynamics are made possible by applying circular construction strategies and are directly related to the previously mentioned characteristics of circular construction strategies. In the context of a real estate portfolio where objects of an organization are spread across multiple locations, this in turn means a significant degree of complexity in its management. This is where CREM comes into play.

Conclusion

The causal relationships between CREM, Flexibility, Circular construction method, and adaptive capacity have not been previously explored in the literature. This leaves the theory at a relatively abstract and basic level. However, it indicates that flexibility is crucial for real estate portfolios in a turbulent environment, making a complex and capital-intensive portfolio like that of Defense particularly suitable for further investigation of these relationships. Time pressure, financial constraints, and changing investment needs make adaptive strategies necessary. Sustainability is not a minor issue but can enhance the flexibility of the real estate stock, this is the idea.

Based on the literature on approaches to flexibility in a real estate portfolio, the following definition to this topic is made: *the ability of real estate to timely adapt to new, different, or changing circumstances/requirements, with a view to value preservation or creation. The impetus for new, different, or changing circumstances/requirements can be found in changing business operations due to demographic, economic, and ecological trends.*

This definition stems from the background of the work of Geraedts et al. (2014), Gibson (2001), and Schneider and Hill (2007). This refined definition is enriched with the theory of Den Heijer (2011), adding value preservation or creation as conditions. Additionally, time has been added as an important factor to express a certain degree of capability.

6. Results

Chapter 6 describes the results of the research and answers the sub-questions of this thesis. First, the interviews are discussed, followed by an explanation of the framework created, and finally, the outcomes of the Focus Group.

6.1 Interviews

In this chapter, the results of the semi-structured interviews are presented. The interview protocol, which includes the pre-prepared questions posed to the experts, is included in the appendix. Also the original Dutch quotes are included in the appendix. Given the nature of the findings and the differences in interpretation among the various functions, it has been decided to split the results into three separate parts: Advisors, Managers, and Needs Assessors. A table is included in the appendix that illustrates this division, along with a brief explanation of the respective roles and an indication of whether the respondent works at the Rijksvastgoedbedrijf (RVB) or at the Ministry of Defense (Defensie, MvD).

Within each respondent group, each individual contributes a unique and valuable perspective based on their own expertise. The strength of the analysis lies not primarily in comparing individual answers, but in the collective added value of the different insights. The actual comparison mainly occurs at the level of the three distinct roles: advisors, managers, and needs assessors.

During the exploratory discussions prior to the interviews, it became clear that 'flexibility' is perceived by many as a catch-all term. Therefore, each thematic section begins with a clarification of what is meant by flexibility, followed by an explanation of the relevance of this interpretation, the perceived added value of it, and the possible implications at the operational, tactical, and/or strategic level. Each section concludes with the risks/disadvantages associated with the respective concept of flexibility.

The interview results are concluded with a synthesis and interpretation, providing answers to the first and second sub-questions of the thesis. Finally, there is a reflection on the previously stated hypothesis, after which it is refined.

Expert Group - Advisors:

The meaning of flexibility

The analysis of the expert interviews with advisors shows that flexibility within the real estate portfolio of the Ministry of Defense is primarily conceptualized as the adaptability of buildings to functional or operational needs.

> **Program Manager Circular Building and Climate Adaptation, Policy Responsible:**
> ‘’Flexibility means that you can easily adapt a building, both internally and externally, I think. …, so in the second phase of use, you need to tinker less, and you require fewer resources. And there will definitely be functional changes, even though we think we can always predict everything and so on, but that will definitely happen. So that flexibility is important in that sense.’’

Programming Advisor:
‘’Because during the life cycle, you really have those small adjustments. People think, I want a little awning added. It's just a bit too small. The door needs to be a bit wider, otherwise you can't get the vehicle in. So I think you keep that in mind. It's of course nice if you think about it in advance. That you slightly over-dimension it, so that more can fit in. And you also have really big adjustments. That you say, the building needs to be flexible enough to add a floor. Or that a wing needs to be added. But there is also another aspect. What we have seen quite a bit in the past is that there was a complete change in function.’’...’’Up to... Well, during the lifespan of the building, being able to take it apart and move it several times. There is also a variant in indeed adjusting the object as it stands for another function.’’

Strategic Advisor DVM:
‘’If we had to use another word for that container concept of flexibility, it would be adaptability."..."Adaptability. I think the model of Habraken, always think about second life.’’

The mentioned dimensions are functional flexibility (adaptability), expandability, detachability, and mobility.

Sustainability Advisor, specializing in circularity, Technical Manager:
‘’It is not so much about constantly adjusting buildings, but about creating spaces that can support multiple functions without physical adjustments.’’... ‘’Users should be able to choose which space fits their activity (quiet, collaboration, education, etc.).’’

‘’We are now focusing on the main load-bearing structure to be able to reuse it,’’ … ‘’it does depend on how you assemble your building, are they 2D or 3D elements?’’

Program Manager Circular Building and Climate Adaptation, Policy Responsible:
‘’Yes, that does vary a bit by usage function. So for those military buildings, yes, they need to be both detachable and movable. For some large buildings, yes, I wonder if that is really necessary. So for example everything in Den Helder, everything related to really critical functions and unique functions, like ports or airports and so on. Yes, I wonder about that, it doesn't necessarily have to be movable. But the things where you expect a lot of changes, those must also be detachable and movable.‘’

Strategic Procurement Advisor:
‘’It is very easy to add or set up an extra room or space. This includes expanding the outer shell of the building. Technically, this can mean that the installation concept is so well thought out that a part of a building can be added and that the concept still meets the requirements, or that the construction is oversized so that an extra floor is possible.’’

Programming Advisor:
‘’Because we no longer build for the first use, but also for the second, third, and fourth use.’’

Program manager of the revitalization program:

''Or you invest a little extra to make it movable and expandable throughout its lifecycle. This also increases your flexibility compared to a traditionally built masonry building.''

''And I do think that 3D is also easier to handle than 2D. If you approach it from the perspective that it needs to change location during its lifecycle.''

''Well, I really believe in that modularity, I do believe that you have fixed building blocks, fixed units, and that you assemble your buildings from those, let's say, Lego blocks.''

Although there is agreement on the importance of these aspects, there are nuances regarding the degree of necessary flexibility per building type, the fundamental role of installations and 'low-tech' solutions, the relationship between initial material input and circular principles, and the interaction between building physical adaptability and user flexibility.

Program Manager Circular Building and Climate Adaptation, Policy Responsible:
''But I do think that flexibility is of course more than just moving interior walls, because you also need to think carefully about... adding or building something. Then you need to ensure that your construction can handle that, so you might need to oversize it, which brings you to the dilemma of using more material initially, which I don't find very appealing from a circularity perspective, and the other is that it should also be primarily internal, …, yes the most flexible would also require looking at, …, for example low-tech solutions with as few installations as possible.''

Program manager of the revitalization program:
''I also strongly believe in factory-based construction towards circularity and reusability.''

''I think you should also see flexibility in that you don't put too much customization into it.''

Programming Advisor
"We would much rather have you reuse a building component than recover the raw material."

Strategic advisor DVM
"The degree to which you want to be flexible is very important to determine."..."the flexibility of the user, yes, that might be the best part."

The necessity of flexibility

The analysis of the expert interviews with advisors shows that there is a necessity for Defense to strategically shift towards a flexible and adaptive real estate policy.

Sustainability Advisor, specializing in circularity, Technical Manager:
"At Defense, we are (so to speak) reorganizing every day."

"They were used to placing the officer in a single room, the non-commissioned officer in double rooms, and the enlisted personnel in quadruple rooms. With less sanitation, so one toilet for every four. Now they all get one-on-one. So everyone in a single room, all with their own sanitation. ... If you ask what that costs more, because we want to be cheaper in operation, then those investment costs go up. But now there is actually a lot of vacancy of

beds within Defense,... We call that ghost sleeper. ..., You do pay for that. So you actually create 30, 35 percent too much real estate. If you give everyone their own room, you can be sure that the room is always occupied. There are no excuses for not being able to rent out a room. And you also know if it is being used, because you can just measure that. And if you are not there, you return your room. So the investment costs per square meter are high, but in the long term, it will save a lot of money. You will create fewer square meters, less environmental burden, lower cleaning costs, lower energy costs. These are very complicated calculations, but you have to believe in it a little."

Programming Advisor
"It is also very strange that Defense has never standardized this, because everything within Defense is standardized. I mean, the word uniform says enough. Everything has a NATO stock number. Whether it's shoes, clothing, a vehicle, everything is standardized, just not the real estate."

Program manager of the revitalization program
"If you are going to create a new building every time, then you get the routine of defining needs, creating a program of requirements, designing, procuring, and executing every time. And that is quite time-consuming."

Due to years of underinvestment, the real estate is suffering from aging, inefficiency, and high operating costs.

Strategic procurement advisor
"For years, there has been too little investment in the real estate of Defense. The technical lifespan is on average quite old, and the maintenance condition is, let's say, not always very good. This results in a lot of money being spent on maintenance for relatively poor quality real estate, like a 'black hole fund' for maintenance."

Programming Advisor:
"What is really detrimental to a real estate portfolio is when you no longer have enough money to maintain it. So, you may build less new, okay, that's fine. But we have just had that for the past 20 years or so, that there was so little money that you are really falling behind in quality."

Strategic advisor DVM
"Yes, you can be very reactive in defense. See how difficult that is, because you are slow in growing and you have neglected what you have. So, you are actually busy patching up your old stuff while also wanting to grow. Yes, hopeless."

Buildings are often already outdated upon delivery and poorly usable under changing circumstances.

Programming Advisor:
"We are very used to building for the first use. So, the program of requirements comes: we currently have 33 vehicles, 5 fighter jets, and 40 people working. So, we build buildings exactly for what is needed now. And that is quite strange."..."But by the time that is completed, you are already years further along. At the moment it is delivered, it is already outdated."

Program manager of the revitalization program

"Because people then always start thinking from a new situation about what they need. And especially in Defense, the functions are relatively simple. So, the basic functions are office, barracks, lessons. You can put that into an incredibly tailored suit, but that tailored suit is already outdated by the time it is built. Turnover in Defense is very high. People change careers every three years, so a new opinion comes in."

Military at RVB, relationship management advisor

"It can also happen that during that time there is a change of command. And that the new commander says that what the previous commander has thought and devised is nice and all, but I want it differently. In other words, you go back to square one."..."I think it only emphasizes the necessity and urgency of being flexible and adaptive even more."

Flexibility is desired due to constant reorganizations, geopolitical tensions, technological developments, staff turnover, and changing regulations.

Program Manager Circular Construction and Climate Adaptation, Policy Responsible

''It is on two, two levels I think that it... For example, what you have seen at the COA. The COA has of course also suffered a lot from that political decision-making. But I would say, also about finances. Prisons, likewise. They have therefore divested too much at a time when they thought it was not necessary. And you can now actually see that from a euro perspective that was really super unwise. (…) But well, if you now see what has been spent on the asylum crisis, then those few years of maintaining vacancy would have been really peanuts. The same goes for the prisons. So I do think that, especially for Defense, it is really wise to think about it that way.''

Program manager of the revitalization program

''How do I retain my staff? That is very important for Defense. How do I ensure a pleasant working environment? How do I make it a bit attractive?''...''You also have technological developments that require different considerations. Vehicles used to always be outside. But vehicles are increasingly becoming mobile computers, so they need to be indoors instead of being under a roof or outside in the open air, which means you need different real estate.''

Military at RVB, Relationship Management Advisor

''What you especially notice, of course, are the assigned tasks that Defense has, what you now also see in main task 1, you notice regarding the geopolitical developments, particularly driven by Russia, that Defense must be able to act more quickly and based on that also quickly arrange the real estate.''

''Only those developments require us as Defense to actually take control and act decisively. In other words, we need to be able to build quickly, we need to be able to act quickly, and so on and so forth.''...''Think for example of the whole nitrogen discussion. Okay, we want to build faster and that's fine, but if we look at, for example, your environmental measures, your nitrogen, and so on, yes, everything is already quite locked down.''

Strategic advisor DVM

''Real estate just has to adapt, I believe that.''

''Then you have to realize that due to the organizational changes you go through, world politics, looking at an area differently which causes functions to change, you just have to accept and realize that there often need to be changes made to real estate.''

''Real estate is clumsy, heavy, dumb, and solid. And that costs money.''

''The demand will always be there. I am convinced of that. Scarcity of land will always exist. And scarcity of materials, people too.''...''So make it smart the first time, so that it is adaptable.''...''So we are now also calling out at a strategic level to facilitate that adaptability over time.''...''We are also calling for more attention to be paid to the existing market. And to rent and purchase what is available.''

A future-oriented approach requires standardization combined with adaptability, through IFR construction and designing for reuse.

Program manager for circular construction and climate adaptation, policy responsible:
"What I think about flexibility, but maybe more people have said this, is that you have to think smartly. We are trying to do the same for circularity; it's also about designing for the second use phase. But that doesn't have to be every function. So, it's not that you have to make every function possible in that building, in my opinion. And you can think smarter about that."

Military at RVB, relationship management advisor
"Then you naturally get a bit of a chicken-and-egg discussion about whether we can build now and set aside those restrictions regarding nitrogen, or do we say no, we will adhere to the rules as they currently apply, but that has consequences, for example, a certain construction project, etc., will just take longer... so that's why IFR construction and standardization must ensure that..." "Adaptive in the sense that the tasks of Defense change, especially at strategic locations, etc."

Strategic advisor DVM
"That is very broad in the armed forces because we now also have the big challenge that we cannot replace our arsenal, but we have to adapt our existing arsenal."... "Those investments to keep adapting all the time, that is new. That is really the future."

"Land politics is really decisive for these kinds of things."... "It's the Netherlands; it's getting quite busy with everyone. That makes you have to look much more flexibly at real estate."... "Just assume it's there, and you have to adapt it."

Additionally, there needs to be investment in smart, flexible solutions such as larger, more efficient buildings. This will yield both functional and financial benefits in the long term.

Programming Advisor:
"What I saw, we had the suspension of conscription. And what you had with conscription was that you needed a lot of relatively small buildings. Because each group that was trained had its own little building. If you no longer have conscription, then you actually want something different. So, you actually want fewer small buildings and very few large buildings. That is a movement we have seen."

The added value of flexibility

The analysis of the expert interviews with advisors makes it clear that flexibility in the real estate portfolio of Defense is not a luxury but a strategic and financial advantage. Although the initial costs may seem higher, flexible buildings will yield significant savings in the long term due to lower operating costs, reusability, and reduced vacancy rates.

> **Program Manager Circular Construction and Climate Adaptation, Policy Responsible**
> Well, look, I think it makes a lot of sense to invest that 10% extra cost. Because, yes, once again, it will save you money, it will reduce hassle later on, and you will be less dependent on, when you need to build something new again. You won't need defense capacity, RVB capacity, market capacity, or raw materials. You have already built all of that once. You only need, for example, for such a barracks building, you do need a truck driver. Just to simplify it. That's really something different. So I really think that 10% is just peanuts when you look to the future. It will actually only save you money, is my assumption.
>
> **Strategic procurement advisor**
> "Although the societal argument for sustainability and circularity is important, I want to emphasize that the financial argument is more helpful than the societal argument in decision-making processes within organizations. That lifecycle cost approach makes the investment in flexibility financially justifiable."
>
> **Programming Advisor**
> "There is value in it, and that is new. Yes, for two reasons. One is scarcity, and the second is that you can move it, you can take it apart."..."I find it advantageous when you look at it this way; then you will also take care of it. You will ensure that it is well maintained. Because if you don't, you will see that value decrease."..."It would be a nice new mindset."
>
> **Strategic advisor DVM**
> "So when you build an office, you also get a second designation for housing from the municipality. What is the effect of that? It turned out that if you arrange that in advance, it is valuable for the investor. Because they know their vacancy risks are lower; in 20 years, when we have the next pig cycle, I can convert vacancy to housing without hassle."

Moreover, flexibility improves operational effectiveness: faster construction times, cleaner production, and multifunctional use make the real estate future-proof.

> **Programming Advisor**
> "We think that you can make it much faster. So at least the actual construction time, that is, on-site, is shorter, resulting in less inconvenience. We believe it is cheaper, and we think you need less material. Nitrogen can certainly help. Once you are in that flow, you can add all sorts of benefits."
>
> **Program manager of the revitalization program**
> "And it simply reduces inconvenience at the construction site. And that also makes it cleaner because a large part of your production takes place in the factory. And you have that disassemblability for your circularity at the end, and then it depends on whether you invest a

little extra to make it still movable and expandable during its lifecycle. Thus, you also increase your flexibility compared to a traditionally built structure."

Military at RVB, relationship management advisor
"So that we can act faster, call things off faster compared to traditional buildings"..."At the moment you move more towards standardization, prefab options, you are much more flexible as Defense. Then you can also switch faster when the situation demands it,"

This approach also offers societal benefits, such as resource savings and circularity, where buildings can have a second life.

Programming Advisor
"I feel that we are now a bit ahead of the rest of the Netherlands in utility construction. That is also nice. You can set a trend and show that it is possible. And if the rest joins in, then it becomes more interesting in terms of interchangeability. I think there is also an economy of scale in it."..."Not only in your construction but also in the exchange afterwards."..."Yes, and that has societal value apart from this (financial) value."

Program manager of the revitalization program
"By limiting your resource depletion by 80%, it could be a cheaper or better solution for society."

The greatest gain, however, lies in a cultural change: from thinking in terms of single use to designing for multiple life stages and functions. Flexible real estate requires strategic thinking and provides organizations like the Ministry of Defense with greater agility, sustainability, and long-term value.

Programming Advisor
"What I believe helps us the most, but we cannot solve this, is simply a cultural change within the Ministry of Defense. We are very accustomed to building for the first use... You could also say, the Kromhout Barracks is a nice example. They have simply put up a series of office buildings, a series of barracks, a large parking garage, a meeting center, and a company restaurant. And defense components were deployed. And you just adapt, this is the real estate you have. Because we no longer build for the first use, but also for the second, third, and fourth uses. And if that becomes your mindset, then the real estate needs to be less flexible as the organization becomes more flexible. I believe there is a lot of gain in that."

"And what can also help, of course, is making choices. That you create multifunctional buildings. So buildings where you can store your supplies, your vehicles, and your offices. I think they can last much longer. It is much easier to interchange functions, of course."

Flexibility at operational, tactical, and strategic levels

The analysis of the expert interviews with advisors shows that flexibility in the real estate portfolio is only effective when applied at all levels: strategic, tactical, and operational.

Program manager for circular construction and climate adaptation, policy responsible:
"If you do it right, you do it at all three levels."

Currently, the emphasis is mainly on operational flexibility, such as adjusting interior walls or changing functions on-site. While valuable, this leaves the larger potential untapped.

Programming advisor:

"I mainly see it at the operational level."... "You should want it at the strategic level."... "Actually, you want to agree on that at the strategic level. Everything within the Ministry of Defense is standardized, so is real estate. And we no longer build for the first use. We just set it up. You have to deal with it. That is, of course, a truly strategic decision."

The real added value lies at the strategic level: creating flexibility in the portfolio, anticipating societal developments, focusing on remanufacturable construction, and standardization.

Program Manager Circular Construction and Climate Adaptation, Policy Responsible:

''I believe that by making it remanufacturable, you can benefit more from the raw materials that you can extract from your portfolio, which will become increasingly necessary given the scarcity of raw materials. Only when you make it remanufacturable can you benefit from residual value, so from a financial perspective, I find it all very strategic, more strategic, actually strategically tactical, so yes, and tactical and operational, yes, then we eventually talk about moving interior walls, which is also important.''

Tactical flexibility serves as the bridge here, by designing buildings in such a way that future adjustments remain possible, for example through oversizing or expansion options.

Program manager of the revitalization program:

''What I find important for flexibility is to create oversizing. So really ensuring that you make the doors as large as possible. That you give the building half a meter more height for workshops, for warehouses. That you hope the next vehicle can also fit in.''

The biggest challenge lies in the lack of a clear, future-oriented vision and the ability to make flexibility concrete.

Strategic Procurement Advisor:

''The market often asks how flexible do you want it to be? Because what are the possible scenarios that will occur in the future to determine how flexible it needs to be? Unfortunately, there is often a lack of a clear answer from the client, there is a lack of vision. This is the issue that makes it difficult to ascertain now.''

Strategic Advisor DVM:

''Then you see the dilemma between the old barracks, where you must see the existing context as a given. You cannot think modernly about the first ring of safety, the second ring of safety. You still have to deal with context.''

''At a strategic level, you must be flexible in the existing context to realize your ambitions, and for new construction projects, you can create exactly what you want, so of course, every city is a product of its time.''

This calls for a cultural change, from ad-hoc thinking to strategic steering, and from customization to standardization. In particular, new construction offers opportunities to shape this transition.

Programming Advisor:

"But that requires a cultural change. And who has the courage to do that? On the other hand, if it doesn't work now, it will never work."

Strategic Advisor DVM:
"And if you want to create a central barracks in Flevoland now, you can do everything anew for the first time. You do everything according to the IFR construction methodology. You make all kinds of stamps, and ideally, you just stamp the building... so passing on changes means adaptability over time at the building level, that goal we just discussed, and that makes a lot of sense at the area and object level, the object being a barracks."

Risks associated with flexibility

The analysis of the expert interviews with advisors shows that although flexibility in the real estate portfolio offers much potential for future-proof construction, it also brings risks. These risks relate to financial, market-oriented, regulatory, and especially cultural domains.

Program manager for circular construction and climate adaptation, policy responsible:
"I really don't mean to be cynical, but when you look at the large projects in the Netherlands, also for infrastructure and so on, the societal cost-benefit analysis has never been decisive in the decision. So decision-makers always decide differently, even though they think, and find, and want to do it based on rational things."

Military at RVB, relationship management advisor:
"But that also takes time and capacity. Especially, of course, time and capacity. That is currently difficult to achieve. You literally and figuratively come up short on hands. The ambition is high, the goal is high. But the actual realization, both from Defense and from the RVB, but also from the market. So the contractors, etc., who will have to realize it later, the factories that have to build it, etc. Everyone is fishing in the same pond, of course, to bring people in and also to actually get it realized."

Strategic Advisor DVM:
"It is very uncertain whether you can get new construction."... "New construction, well, just look, material scarcity, labor scarcity. And now we still have to want speed, so tempo scarcity due to all the complex bureaucracy that we as professionals have made out of construction, while it is just stone on stone, right? Yes, it is actually not that difficult, but we have made it difficult, so that is indeed the case, and cherish what you have and then look at what you miss, and you need to hire, purchase, or build new. That is the next thing."

Financially, the higher initial investments are difficult to justify as long as it is unclear whether the flexibility will actually be utilized.

Sustainability Advisor, specializing in circularity, Technical Manager:
'A lot cannot be quantified, we are often asked; what does it cost more? But that calculation is really very complicated. Often, only the investment costs for the building are considered again. But ultimately, you want to know what this does for the long term at the inventory level, in the broadest sense. So Total Cost of Ownership.'

"If you want to build adaptively, you need to create something that is suitable for many. That does require some extra investments. That is also a difficult point."..."If you say that in Den

Helder we need eight stories high and it has to be suitable for that. And then you buy according to a construction system that can be made in Den Helder. That is of course an overinvestment at all those other locations."

The focus on short-term costs undermines investments in future-oriented solutions. The benefits of flexibility often only become visible to a subsequent user, complicating investment decisions.

Programming advisor:
"The scarcity of materials is indeed becoming a problem."

Program manager of the revitalization program:
"This one is more expensive, so it is simply said, that door is too big and we don't know how big the next one will be, so we are not going to do that big door. Just purely to save 10,000 euros."

The market is still insufficiently mature. There is a limited number of producers, material scarcity, and a risk of over-demand without a clear vision. This leads to reluctance in tenders and traditional construction parties may be excluded.

Program manager for circular construction and climate adaptation, policy responsible:
"Well, the risks are that there are not many factories that can build this."

Additionally, changing regulations, complex permitting procedures, and physical limitations of existing locations pose significant obstacles to flexibility.

Sustainability Advisor, specializing in circularity, Technical Manager:
"Moreover, there are risks in terms of regulations and future requirements, such as changed standards for floor heights or load-bearing capacity, which may render current designs unusable in the long term."

Program manager of the revitalization program:
"Yes, all your permitting procedures and such, which are quite decisive in the Netherlands, will remain even if you are going to relocate a building. Yes, unless you really choose a temporary building for five years."

Mobility or adaptability does not automatically guarantee ease of use within the legal or spatial framework.

Strategic Procurement Advisor:
"If a building is delivered as movable, but after a few years it turns out this is not the case, the contractor may no longer be held accountable if they have been gone for five years and there are no contractual conditions left."... "The market is generally not happy with such open ends in order portfolios, because they have no idea how, what, and when."... "This can lead to reluctance in bidding."

Strategic advisor DVM
"And if you create a residence somewhere, there can be no industry next to it. If you move in somewhere, you can no longer build industry next to it. The same applies to a military base.

You cannot live next to a radar dome. So if there is a residence, you cannot place a radar next to it. Nor ammunition. So it has quite an impact."

The biggest barrier, however, is cultural. Within Defense, a short-term mentality prevails. Real estate is not considered a valuable asset.

Programming Advisor
"What I think helps us the most, but we cannot solve this, is simply a cultural change within Defense."

"It is deeply ingrained in the culture that, indeed what you say, it remains standing until it falls apart out of misery. Nothing is ever repaired, or almost nothing is repaired. It is always demolished, and then we put something new down. It is also not in the books, so it has no value. It is located on a site with a military designation. That is often right in the middle of the Veluwe, so it is of no interest to anyone. So if you want to sell something, yes, it is simply worth nothing. So it is not depreciated either. The moment you have invested in it, your money is gone. That is a bit of the philosophy."

Military at RVB, relationship management advisor
"No, I don't think so. Certainly not the last thing you said, okay and then sell again. Yes, no, we know each other. Look, our organization is such that we live for years on budget cuts, or in other words, at the moment we can maintain it. So in other words, yes, we are not just going to say okay we need it now and then we will dispose of it again."

"We now have a horizon of 15 years. And whoever lives, takes care. That is of course also an attitude. However, our experience from the past is that yes, you have to ensure that you keep what you have, and then you can better build sustainably because who knows, we might be stuck with it for the next 50 years, you notice that there is also a bit of tension in yes yes."

Strategic advisor DVM
"For real estate, for defense, the world is restless. That is of course strongly determined by how much space we need or not. And that is now filled every time by, yes, thinking about ownership. We have sites that have been sold, and then we buy sites again. Yes, that is inefficient again. Things are then demolished and then we build them new again. Land is the scarcity, I always think."

There is skepticism about the actual use of flexibility and little room (time, money, people) to execute this well. Moreover, digitization and modularity bring new vulnerabilities, such as security risks.

Strategic procurement advisor
"Incorporating flexibility, especially mobility, can be significantly more expensive. The costs are, I believe, 15 percent higher if you request that across the entire portfolio of this task. This is a difficult point if one is not sure whether and when the flexibility will actually be used, because for that 15% you could also build more buildings now."

'If extra costs are paid for flexibility that is never used, the question arises whether government resources have been spent efficiently.'

Programming Advisor

‘But I don't believe that we will include this in the books. It's so ingrained in the DNA of Defense that we won't do it.’...‘Defense doesn't guarantee it either. They don't guarantee anything at all. They say they are so large that the premiums are too high.’...‘It just doesn't fit with the culture of defense, so I really don't think it's going to happen. Crazy, right? Yes. Because there is a chance.’

Program Manager Circular Construction and Climate Adaptation, Policy Responsible

‘You do give your, but that has a bit to do with security, I think it is less resistant to damage in potential, because you can easily unscrew it and you have to make good agreements because the entire construction program is of course completely digital in such a factory.’

Outcome expert group - advisors:

Flexibility is primarily interpreted by advisors from the Rijksvastgoedbedrijf and Defense as adaptability, both internally and externally. It concerns the ability of buildings to fulfill multiple usage functions, for example in a second or third life phase. Based on minimal physical interventions; the so-called 'tinkering' should be avoided as much as possible. A distinction is made between small and large adjustments, with the latter often involving over-dimensioning. It is advised to structurally over-dimension new constructions to allow for future expansions, such as adding floors or extensions. Some advisors also advocate designing buildings from the start so that they can be used for various purposes without major physical adjustments.

Although relocating functions or even entire buildings is mentioned as an option, there is significantly less confidence in this. On the one hand, due to the high investment costs, especially when a large part of the real estate is not utilized in practice. On the other hand, the strong contextual anchoring of functions and their limited mobility play a hindering role.

A challenge in realizing flexibility lies in the organizational culture and the attitude of users. Advisors often point to this as the main obstacle. However, flexibility is increasingly on the agenda, partly due to reorganizations within the operations. These changes involve not only the relocation of functions but also a reconsideration of usage standards, with military use often being mentioned.

The added value of flexibility includes time savings. Initially through standardization in design and execution, later through the simpler ability to adapt in an increasingly complex legal and bureaucratic context. In addition to time savings, long-term savings are also mentioned, although these prove difficult to quantify. By gaining leverage on these factors, the quality of real estate use can be better secured in the future, which also provides added value.

Another essential aspect is the strategic value of land positions. The preservation and optimal utilization of these play a crucial role in facilitating flexibility. Moreover, flexibility leads to reduced dependence on personnel (within the RVB, Defense, and the market), in an era where labor market scarcity seems structural. It also provides an answer to material scarcity by promoting reuse. Although the financial benefits can be significant, they are difficult to express in numbers, which reduces the persuasive power towards decision-makers. However, flexibility does contribute to a lower risk profile for investors. On a smaller scale, limited nuisance on, for example, barrack grounds is also mentioned as an advantage.

Flexibility can be organized at different levels: operational, tactical, and strategic. Currently, the operational level is considered feasible. However, the step towards strategic flexibility requires a profound organizational adjustment and especially a clear, shared vision, which is currently lacking. Moreover, opinions on this vary; while one advisor is convinced of the necessity and feasibility, another responds with skepticism.

The existing spatial and functional context of barracks also makes it difficult to actually implement strategic flexibility. Finally, there are various risks associated with this endeavor. Organizations struggle with a lack of time and capacity, and additional investments in the present are rarely legitimized by benefits that only become visible in the long term. This complicates political decision-making, especially when future returns are difficult to quantify. The market is also currently unable to meet the demand for flexible real estate on a sufficient scale, while legal requirements pose an additional obstacle.

Expert Group - Manager:

The meaning of flexibility

The analysis of the expert interviews with managers shows that flexibility essentially means a broad adaptability of buildings to meet changing needs in both the short and long term.

> **Chairman of the Defense Program Team:**
> ‘’Yes, flexibility in my opinion can be thought of in terms of short-term and long-term’’...’’Another term for flexible is, I think, adaptability.’’
>
> ‘’The construction style must be such that you can add a meter, remove a meter, and rotate a quarter there.’’
>
> **Former Head of Program Management at DVM:**
> ‘’So the whole conceptual thinking is much more flexible and future-proof.’’

It includes the ability to change functions, physically adapt spaces, and deploy buildings multifunctionally, from storage and workshops to classrooms. The driving force behind this need is the growth of the organization and the dynamics in occupancy and investments.

> **Chairman of the Defense Program Team:**
> ‘’This product, the building, that can meet multiple needs. That is flexible in my opinion’’...’’it can have different functions. Then you are not talking about being demountable, but you are just talking about, okay, I slide it out a bit, lift it a bit, scale it down a bit. It’s like a matchbox that you can move around all the time.’’
>
> **Former Head of Program Management at DVM:**
> ‘’A very adaptive module, which is large and voluminous, that we can place behind the warehouse. But we can also use it as storage, we can turn it into a light workshop, and we can even make it a classroom where vehicles are driven in for teaching about the vehicle. So different applications precisely because we are trying to build large, robust, and future-oriented.’’

Flexibility leads to the preservation of residual value and contributes to future-proof real estate. The practical realization lies in standard modules and robust building styles, which allow for rapid interim changes. Although broadly applicable, the acceptance of flexibility in specific contexts should not be taken for granted.

Chairman of the Defense Program Team:

"Flexibility is indeed applicable everywhere, but not acceptable everywhere."

Former Head of Program Management at DVM:
"That investments in complexes, so who sits where, sometimes changes."..."a residual value keeps … if you deem a building surplus, then you will demolish it or, well, sometimes if possible, a change of function if it is adaptive, but it also retains a residual value."..."standard modules like Lego blocks, we sometimes say to make it clearer, you can actually assemble everything."..."Just don't cut a building block into pieces, make it fit, because then it's no longer a standard building block."..."those interim changes can facilitate growth at a later moment faster."

The necessity of flexibility

The analysis of the expert interviews with management shows that flexibility is not an option, but a necessity for the real estate portfolio of Defense. From addressing the backlog of real estate and responding to unpredictable technological and operational needs to dealing with changing usage patterns, an exploded workload, and complex societal factors, the need for adaptive capacity is visible on multiple levels.

Chairman of the Defense Program Team:
"Flexibility is needed due to technical developments and policy developments, sustainability, zero on the meter, that kind of thing."

"Specifically for Defense, technological developments such as drones are important, which are quite different from a tank workshop and where you still need to focus on. What does that bring us? And what should we dimension ourselves to?"

"If the need of Defense is to move from traditional warfare to semi-hybrid warfare, then we will also need to adapt our real estate."

''As raw materials become increasingly scarce, it doesn't matter what the costs are. We will recoup the costs anyway. The lack of raw materials means that circular building is the key, because otherwise we won't make it.''

"The complexity of where and why construction is taking place is becoming increasingly complicated due to zoning, political currents, geopolitical unrest, which calls for adaptability."

Former Head of Program Management at DVM:
"The portfolio is quite large, and the effective use is much lower."

"A much larger part is older, has energy labels G, F, H, very high, and is technically heavily degraded or the floor plan is no longer applicable to what we desire now."

> “The capacity of the Rijksvastgoedbedrijf, but also our capacity to engineer all projects individually, is no longer possible. That is the short answer. And why is that? Because our workload has exploded, the assignment and also in terms of budget, that we actually had to look for a different method.”

The solution lies in a strategic shift towards the standardization of building blocks and a robust, future-proof approach that enables quick and efficient responses to dynamic circumstances.

> **Former Head of Program Management at DVM:**
> “Standardizing building blocks should help us manage that enormous flow of assignments, so to speak, because it simply cannot be done otherwise. It simply cannot be done otherwise. We do not have the people for it, and also in terms of nitrogen, regarding nuisance at existing locations, it is almost unmanageable. Then the construction pit takes way too long. You also need to build quickly, so to speak. So time is really a critical area, yes.”
>
> “The re-scaling will cost us so much energy, time, and money that we will also start to feel pressed for time and are at risk of that.”
>
> “Because the dimensions of the equipment we receive are simply difficult to predict.”

This flexibility is essential to meet the fundamental obligation “to provide adequate real estate for the people who work hard for our safety.” Without this flexibility, Defense risks getting stuck in a changing world.

> **Former Head of Program Management at DVM:**
> “What I mean to say is that the future is not always predictable. Because if we need to order something new tomorrow, of which we do not yet know what it looks like, then you cannot say in advance what the storage conditions or the dry air will be.”
>
> “No, we are therefore obliged to our stakeholders to provide adequate real estate for the people who work hard for our safety. That is what we are here for.”

The added value of flexibility

The analysis of the expert interviews with management shows that it goes beyond just the physical adaptability of buildings; it is a strategic approach that leads to lower operating costs, more efficient space utilization, a more robust Total Cost of Ownership, and greater readiness for future demands.

> **Chairman of the Defense Program Team:**
> “It can lead to more structure and more water from the tap, and during the operational phase, reduce costs. Less special, then.”
>
> ‘The key lies in reducing the total cost of ownership.’
>
> ‘The ability to anticipate and meet the future needs of Defense, such as the shift towards semi-hybrid warfare.’

‘A flexible building, such as a workshop, can be made so abstract that it no longer matters what is inside. Whether it’s a tank or a drone. This prevents the building from requiring a completely different sizing of the material.’

‘Just go for an overkill, because you will always see that especially in the future, and with Defense nothing is temporary, even the temporary buildings are forever. You know, those things stay there for so long that if you over-dimension now, you will see that in time it just makes the city.’

Through over-dimensioning, functional adaptability, and the possibility of relocation and sale, real estate becomes not only more sustainable but also commercially more attractive.

Former Head of Program Management at DVM:
‘Not having to make that deep investment for something new every time, but rather focusing on, well, we just move things, which I think can gain us some speed in planning.’

‘You can just put it on Marktplaats and say, well, I have a building here and we are going to sell it.’

‘So actually, you can very quickly say, “I want six blocks of this, twenty of that, thirty of this, and two of those,” and with all the requirements that come with it, you can quickly generate an output specification or a tender. And with tight capacity, personnel, and such a method, that is the way to success.’

This flexible mindset enables organizations to respond more quickly to changing operational needs and optimizes the entire real estate portfolio. Investing in flexibility is investing in a future-proof, cost-effective, and agile real estate landscape.

Former Head of Program Management at DVM:
‘And with more needs, it can be relocated so you quickly have a larger building.’...‘That I try to set the playing field at the front as wide as possible, to indeed facilitate those interim changes faster in case of growth at a later moment.’

…‘Then IFR can certainly help. Exactly what I said at the beginning, that if a location is staffed by a group that has become smaller, but so small that it no longer makes sense for them to be there, yes, they are moved and placed elsewhere. And how easy is it that the real estate they currently have can go along.’

Flexibility at operational, tactical, and strategic levels

The analysis of the interview results shows that flexibility at the strategic level enables the Defense organization to look further ahead, outline major lines in a real estate plan, and respond more quickly to changing needs, which is crucial in a long-term construction process.

Chairman of the Defense Program Team:
“I think you need to move towards a strategic approach, because right now the focus is mainly on operational and tactical levels.”

> "You will really have to manage which buildings you place where. Even if it's just in relation to whether there is sufficient procurement of energy or enough drinking water. That's what we are currently facing."... "So you need to handle that strategically rather than just building a building."

Tactically, flexibility offers the opportunity to efficiently exchange locations and optimize resources where necessary.

> **Former Head of Program Management at DVM:**
> "Tactically, yes, you can exchange locations if that is really necessary."

At the operational level, it provides essential standardization and predictability for the staff, contributing to their well-being and effectiveness.

> **Former Head of Program Management at DVM:**
> "And operationally, it's mainly about being able to show the staff what your standard is. So if a soldier is in Ermelo or Oirschot or Den Helder, the barracks room should be roughly the same everywhere. So you know what you're getting, which can be beneficial."

Risks associated with flexibility

The analysis of the expert interviews with management shows that risks manifest at physical, qualitative, operational, financial, and reputational levels. The permanent nature of real estate, even of seemingly temporary structures, poses a fundamental barrier to true flexibility.

> **Former Head of Program Management at DVM:**
> "Are we going to grow more than that 25%? Then I have a problem. Or I need to be able to stack, so that I don't have GFA, Gross Floor Area, but a warehouse or a workshop. So all on the ground floor. I just can't stack that."

The reuse of materials or buildings, although sustainable or flexible, brings uncertainties in terms of maintenance costs and especially certification, which complicates quality assurance.

> **Former Head of Program Management at DVM:**
> "A disadvantage, an acknowledged disadvantage is that when we start reusing second-hand products, old roof tiles or so, then that assumption of no costs for the first 10 years becomes skewed. Because, and another point is that second-hand products regarding certification are not yet fully adequate, and I do not mean to say that we should not do it, but I do see it as a dilemma."..."But part of it is simply not certified. And one of the things we assess contractors on is whether the items meet the standards. So that we have quality assurance. I find it difficult. And primarily we are not responsible as the client. The Rijksvastgoedbedrijf (RVB) is supposed to monitor this for us. But an experiment of a project worth a billion. In my case, I find it too risky in this domain. I would rather go for certainty and guarantee than experiment and take enormous risks with it."

Operational flexibility, such as relocating buildings or users, is time-consuming, complex, and can lead to material degradation and the need for costly buffer solutions.

> **Former Head of Program Management at DVM:**

> "That sounds very easy, but you understand that he currently lives there and ultimately has to move to another place, and at the moment you take care of his housing, you have a month or so where that relocation action leaves you with nothing, so you might need a sort of sliding stock to manage that with interim or whatever name you give it. But it's not the case that all the IFR you have is easily relocatable one-to-one, because everyone understands that it's a transition of weeks, maybe even months."

Financial risks lurk due to potential cost overruns in changes to complex contracts. Ultimately, a failing flexibility strategy, particularly due to insufficient quality assurance and unclear requirements, can lead to reputational damage.

> **Former Head of Program Management at DVM:**
> "In that sense, if it falls below a certain benchmark, you can pick up a building and move it, but if it falls apart in the hard spot and can no longer be reassembled, then... The likelihood of changes in all those categories is quite plausible in the future. And then the question is whether such a construction with such a mandatory shopping center with a market party that has a maintenance contract or a PPP contractor will not cost you more than double and you actually get the bill presented."
>
> "The risk is that the quality we need is insufficiently delivered through all those steps."... "If we are not careful, if we do not properly communicate the requirements, it will generate low quality."
>
> "And the biggest risk is that the image here collapses with a bang, and I would find that super, super, super unfortunate, but ensuring quality requirements is essential."

Outcome expert group - management

Flexibility in real estate is interpreted in two ways. On one hand, it refers to physical adaptability; the ability to enlarge or reduce buildings. On the other hand, it concerns functional flexibility, where different functions are possible within one type of building.

The need for flexibility arises from the unpredictability of the future. It is uncertain how the Ministry of Defense will conduct its operations in five, ten, or twenty years, while real estate development is a slower process than changes in operations. Additionally, there is uncertainty regarding the availability of building materials. These factors make it necessary to design real estate in such a way that it can adapt to future needs. However, this presents a challenge; we want to build now with an eye on the future, but we still do not know exactly what that should look like and how to technically realize it. At the same time, the real estate must already be functional today.

There is also an awareness among managers of the value of flexibility, but there is a difference in approach between the Rijksvastgoedbedrijf and the Ministry of Defense. While the RVB sees the divestment of real estate as an option, the Ministry of Defense views it as a loss of a valuable investment. This reluctance is associated with the belief that real estate is a long-term investment that one does not simply give up. A possible solution lies in assigning value to real estate that is relocatable or remountability, so that it can be sold while retaining value.

At the operational, tactical, and strategic levels, managers recognize that a strategic approach is necessary. However, the bottleneck lies in the lack of a clear vision or approach. It is clear that something needs to be done, but how exactly remains the challenge.

Finally, the risks surrounding flexibility primarily involve the uncertainty of what is to come. How do you prepare for a future that you do not know? Additionally, when reusing real estate, the question arises of how quality can be ensured. When one becomes dependent on used materials or complete building components, it is difficult to determine what quality is being brought in and how that quality can be guaranteed.

Expert group - Needs Assessors:

The meaning

The analysis of the expert interviews shows that practitioners define flexibility in the context of Defense real estate as the ability to quickly and easily adapt buildings and spaces to changing needs and operations. This includes the ability to circularly reuse components by disassembling them and reassembling them elsewhere in a similar configuration, thereby preserving their value.

> **Senior project leader real estate Marechaussee:**
> "How can you use it flexibly and maintain a certain value so that you can reuse it circularly?"
>
> "Yes, because in principle, if you can take it apart, then you can put it back together in the same configuration somewhere else."... "So yes, I see a lot of flexibility in that."
>
> **Program manager construction (DVM):**
> "Can you go so far that you can make a building that was perhaps initially a barracks very simply flexible enough to quickly convert it into office space? There will also be technical permit requirements, of course, so I don't want to say that it can always be done just like that, that you can switch faster with the real estate you have in your portfolio."
>
> ''It should be easily adaptable to a type of business operation''...''This business operation can change. Because another unit is involved or other activities take place. And then you should be able to adjust it more easily if necessary''...''It should actually be such that it is usable for multiple activities.''

Standardization enables the Ministry of Defense to expand quickly and use their real estate flexibly, for example, by easily converting a barracks space into an office space. The goal is to be able to respond more quickly with the existing real estate portfolio, so that new needs do not always have to be formulated or large-scale renovations are required.

> **Program manager construction (DVM):**
> "Nothing is as changeable as the Ministry of Defense"
>
> "That you do not have to set up entirely new needs again or do new renovations or anything like that."

Flexibility and standardization are seen as a solution to the sluggishness of real estate development within the Ministry of Defense, where new construction projects can take four to five years, while

operational needs, driven by rising tensions, can change much more quickly. By creating a “flexible shell” around the defense real estate, it can respond more quickly to a greater need for real estate. Ultimately, real estate must be flexible enough to be usable for multiple activities and easily adaptable when another unit moves in or other activities take place.

> **Program manager construction (DVM):**
> “The Ministry of Defense, the real estate is very slow; if I give an order here, I will only have the new real estate in four to five years, so to speak, while the rising tension we are talking about can happen much faster, so you may need more real estate much earlier, which you could perhaps solve by creating a certain flexible shell around your defense real estate.”

The necessity of flexibility

The analysis of the expert interviews shows that the needs assessors find flexibility important for the Ministry of Defense. They state that real estate must be as flexible as the expenditures of the Ministry of Defense itself. Flexibility fundamentally revolves around the ability to respond to changing circumstances. This includes, among other things, that the Ministry of Defense must be able to respond quickly to, for example, an increase in personnel, without being hindered by rigid construction procedures or limited maintenance budgets.

> **Senior project leader real estate Marechaussee:**
> “The flow in the coming years. That it is really going to be a big thing. That it is simply no longer about materials.”
>
> “New materials. Yes, but that is why I advise as a second measure a circularity index of 80%. Force the market, stop looking at all those new materials, because as the Ministry of Defense, I have such an enormous stock of buildings.”
>
> “In that sense, the expenditure is very flexible, but the realized real estate is not.”
>
> **Program manager construction (DVM):**
> “Because now we have too much real estate in relation to the budget we have, and I can also turn it around; we have too little budget to maintain the real estate, so you will have to deal smarter with your environment, with your resources, in this case, your square meters, so it would be nice if you could reduce that.”
>
> “In times of vacancy, as you just mentioned when there is less pressure and Defense is scaling down, then the financial issue arises again, yes those buildings are empty, what are we going to do with them?”

Additionally, flexibility means looking for opportunities outside one's own premises. The practitioners refer to a “flexible shell” around the organization, where external capacities and non-Defense buildings can be utilized. Think of temporarily hiring accommodation during high capacity needs or implementing remote work, which reduces the need for physical housing on barracks.

> **Program manager construction (DVM):**
> “Why should you provide accommodation, bring people in, beds, why should you do that on a barracks? (...) You can also work outside your fence, you can look for accommodation that

you can allocate in times of high need. And in times of lower need, you don't need that. So you will focus again on your own premises. That is also a piece of flexibility. That is a certain shell that you place around your defense organization, utilizing external capacities."

"Why should I work here, while I can also work outside the fence? That also happens, because I am also working from home, so that is a certain flexible shell that utilizes not the defense real estate but other real estate, so you could also implement that as a piece of flexibility."

The practitioners assess the current situation of Defense as inflexible and contradictory. The real estate does not align with the dynamics of fluctuating budgets and personnel needs. They advocate for a future-proof approach where materials are not seen as consumables, but as valuable raw materials. Reuse and sustainability should be central, instead of the current traditional approach where building still comes down to "stacking stones."

Senior project leader real estate Marechaussee:
"It is just the tension field you are in. You want to, but you are being held back. You get more people, and thus you want to build, but you are not allowed to build. So that is an incredibly contradictory situation."

"The old-fashioned way, stacking stones with cement in between, building a scaffold, sliding a plank on top, stacking stones again the next day, and then the mason comes and lays another meter of bricks."... "that waste stream on the traditional construction site is of course gigantic, you pay for that. And through industrial building, you tell the producer of your elements, if you don't make it yourself, I only want elements of 1 meter 20. And I will assemble them. There will be no saw involved in my factory anymore. The only thing I do is assemble."

The added value of flexibility

The analysis of the expert interviews shows that the practitioners see flexibility as a significant added value in various areas. Flexibility allows for extracting multiple values from processes and materials, which ultimately leads to financial benefits.

Senior project leader real estate Marechaussee:
"Then you can extract multiple values from a number, which can ultimately also be traced back financially."

"They can produce faster, produce more, have no frost damage, and so on."

By utilizing industrial construction, more can be produced in the same period, likely at lower costs, which benefits profits. Additionally, it is stated that circular and biobased constructed buildings always retain economic value. The focus is not only on direct cost savings but also on the continuity of the organization and creating a future market by viewing what is currently built as potential building material.

Senior project leader real estate Marechaussee:

> "Because it sees that there is potential building material in it. And he does not do this for his current term, as long as he is CEO or whatever, but you do it for the continuity of the company."..."And the commercial market really looks at euros, but it also looks much more at continuity. You see potential in that. And actually, Defense should also start seeing that. What you are building now is your market for the future."..."One, it is cheaper. Start working with the materials you already have. Then where a market party is willing to pay for it. Your profit lies in industrial building. Because you can build faster and more in the same period. And probably for less money."
>
> "But you know, it will always generate money. (...) If you have built circular and biobased, it always retains some economic value."

An important added value of flexibility is the increased speed and efficiency in the construction process. Large quantities of buildings can be produced in a factory and then placed on-site on demand.

> **Program manager construction (DVM):**
> "By having the factory or whatever produce large quantities and placing the building somewhere on demand."
>
> "It is mainly about speed now, I think. We need to have something on-site faster, be able to carry out rapid new construction, and respond more quickly to the needs that exist."

This enables organizations to quickly respond to current needs and realize new construction rapidly. The concept can even be applied as a 'swap location', where buildings can continuously be emptied, filled, and exchanged, for example, at a barracks.

> **Program manager construction (DVM):**
> "You could certainly use this concept by continuously emptying a building, putting a new building in it, and this is really a kind of swap location that can be limited to the barracks."

Moreover, with IFR construction nowadays, it is possible to aesthetically integrate modular, stackable elements, so that the exterior no longer shows the "container-like aspects" of stacked units, by applying beautiful shells that can be pre-processed in the factory.

> **Program manager construction (DVM):**
> "Nowadays, so much is possible in IFR. That, so to speak, you don't even see on the outside that it has, I'm just mentioning container-like aspects that you stack. That doesn't even have to be the case anymore. You can make very nice shells around it, and all of that can be neatly pre-processed in the factory."

Flexibility at operational, tactical, and strategic levels

Strategic flexibility is considered a higher, more abstract level. It includes the ability to relocate or dispose of entire buildings, such as offices or barracks, when they are no longer needed, and possibly rebuild them elsewhere for other parties such as municipalities or commercial companies.

> **Program manager construction (DVM):**

‘’At every level, you need a certain degree of flexibility.’’

‘’At our level, because this is the execution level, yes, somewhat, but it would mainly be about the flexibility to build a certain building in such a way that it is flexible.’’...‘’Whereas at the theoretical level, I think it requires a very different kind of flexibility.’’

‘’Strategic. I think that is more at a higher abstract level. It relates more to the strategic space that the flexibility you want from your barracks requires. You need to have certain reserve space to be able to switch quickly to deploy extra units or activities. That is somewhat at a higher level for me.’’

Although some consider the relocation of entire buildings in the future unlikely due to land shortages, land is seen as a key factor for strategic real estate flexibility. It also concerns the ability to adapt the 'shells' of buildings, including installations, window sections, and facades, for renewal in urban centers.

Senior project leader real estate Marechaussee:
‘’I never believe they will relocate buildings in the future. I never believe it. Because we have no land. I think land is the key.’’...‘’Land becomes key in terms of strategic real estate flexibility, I think, assuming it continues to grow in that sense, yes, and the cores of the city are being renewed, but the question is, with flexible construction, will you also replace the shell? Will you replace the installations? The window sections? The facade?’’

At the tactical level, flexibility concerns the flexible use and preservation of the value of buildings or materials, aiming for circular reuse and keeping materials as high as possible on the R-ladder. It is advised to adopt a disassembly index of 80% to ensure reuse.

Senior project leader real estate Marechaussee:
‘’How can you use it flexibly and maintain a certain value so that you can reuse it circularly? So that means that if you had the R-ladder, you would actually monitor to keep the materials as high as possible on that R-ladder.’’

‘’Then I advise Defense to aim for a disassembly index of 80%. Because with that, you can always reuse it.’’

This level also concerns flexibility in determining elements or modules. Examples of tactical flexibility include the ability to expand a barracks building from 200 to 300 rooms through additions, extensions, or modifications, or continuing to build a workshop in the same framework when an extra unit is added.

Senior project leader real estate Marechaussee:
‘’Flexibility in determining your elements or modules, actually.’’

‘And if at some point you need a barracks building for 200 people, then you will build it and the world changes. We are going to expand the armed forces and we need to expand the building from 200 to 300 rooms. You can do that in several ways. Add on, build up, extend,

whatever you call it.'...'Yes, then we are particularly talking about the tactical level of deploying flexibility.'

Operational flexibility is located at the execution level and relates to adjustments within the building itself. This includes the easy addition or removal of interior walls, or changing the direction of doors.

Senior project leader real estate Marechaussee:
'In the building, add a wall, remove a wall. Door turning left, turning right. Yes, I can do that.'...'And that's where I will make my profit. The optimal of assembling.'

Core concepts here are optimizing assembly processes and applying just-in-time delivery in the construction process. The 80-80-80 rule, disassemblability, circularity, and a reusability index are relevant in this context. A concrete example is the manufacturing of flexible homes in a factory, which are then transported to the construction site as modules and linked together to quickly create living space. At this level, flexibility revolves around the execution of how a building can be utilized as flexibly as possible.

Senior project leader real estate Marechaussee:
'Suppliers of cabins, of the chassis, of the tires, of whatever else. All just in time. And you can certainly do that with the construction process as well.'

'The 80-80-80 rule. So it mainly concerns disassemblability. Circularity. And reusability index.'

'What they are doing now, the manufacturer makes flexible homes in the factory. They have a ground area, I believe 4 by 5 meters, then create three floors and place the backs against each other. And so you have 60 square meters of living space. Well, over three floors. And you put that on the back of the little building on a low-loader. And they hoist them together at the construction site. And done, here is the key.'

Risks associated with flexibility

The needs assessment handlers signal various risks and obstacles that hinder the flexibility of Defense. An important bottleneck is the unpredictability and sometimes unreliability of flexible solutions. In practice, these solutions often deviate from the original intentions, leading to disappointment. Additionally, hesitance regarding data and data security plays a role, undermining trust in certain flexible approaches.

Senior project leader real estate Marechaussee:
'Saying that I have already tested it and tried it and it falls disappointingly short. He makes something different from what you had in mind.'...'Yes, there are undoubtedly good programs already, but it's a bit with data and data security that you can't trust everything equally. We are cautious with that.'

Furthermore, thinking in short terms hinders flexibility. The emphasis is strongly on annual budgets, which leads to the avoidance of long-term solutions such as circular building because they are initially perceived as costly. Although there are often resources available, rigid financial rules and budgeting systems ensure that projects have little room to maneuver. Maintenance backlogs due to previous cuts further increase long-term costs and limit the adaptability of existing buildings.

Senior project leader real estate Marechaussee:
‘They are actually only looking at this year. What money do I have this year and what can I do with it? And circularity, I don’t know that. That will undoubtedly cost money. We won’t do that.’...‘It’s all short-term thinking.

‘’No one can answer that (about the question of how to measure circularity). And that is not only in the real estate sector. The entire organization wants to be 50% circular. In weight, in euros, in whatever.’’...‘’That is stated in a policy document. The Ministry of Defense has also told the State. We want to be 50% circular by 2030. Period. So that policy document is a mere formality.’’...’’And then they can say, if you don’t know the answer, then I will lean back. But if you lean back, you will go backwards.’’

Bureaucracy and rigid regulations form a structural barrier. People stubbornly cling to fixed standards and agreements, such as standard dimensions and numbers of facilities, even when they prove to be illogical or inefficient. This rigidity makes it virtually impossible to respond quickly or practically to changing circumstances.

Senior project leader real estate Marechaussee:
‘’It does not meet our standards. Those questioning whether the standards are correct. (...) No, the standard is 18 square meters. Then it becomes not 90% of the price, but 120% of the price. Yes, that cannot be, because I only have 100%. That 100 euros that you are allowed. Yes, but by sticking to that standard of 18, it becomes 120.’’

‘’Bureaucracy. We are completely overwhelmed by bureaucracy. And there is no flexibility in that. In the building, yes. But in the bureaucracy, it simply lacks flexibility.’’...’’Now you just get more and more bureaucracy. And that limits your flexibility. Your adaptability.’’...’’The bureaucracy is already a drama.’’

A deeper cause lies in a prevailing culture of fear, where standardized solutions are preferred over customization. This would lead to uniform buildings with little room for adjustment, which would severely limit flexibility.

Senior project leader real estate Marechaussee:
‘’I think it’s a culture of fear. We only get cookie-cutter solutions. There is no flexibility left in buildings.’’...’’And what if a project turns out to be more expensive, then we have to go back to DVM, supplement with a fund application. (...) Money is not the problem. But just the rules, the budget, and so on.’’

Finally, external factors play a role. Ecological regulations and rulings from bodies such as the Council of State can even cause delays or halts in urgent projects. This creates a tension between the operational needs of Defense and the constraints imposed from the outside.

Program manager construction (DVM):
‘’At this moment, ecology is indeed the bottleneck. I can tell you that. (...) Several projects are now coming to a standstill after one of the latest rulings from the Council of State? While, you know, Mr. Putin is not waiting, so to speak.’’...’’That is indeed a tension area’’...‘’It’s just the tension field you are in. You want to, but you are being held back. You get more people, and

thus you want to build, but you are not allowed to build again. So that is an incredibly contradictory situation.''

Outcome expert group - needs assessors

Flexibility in real estate is increasingly seen as a response to the slowness of real estate development and the rapidly changing demands of the organization, according to the needs assessment of practitioners within Defense. It is about the ability to easily adapt buildings and spaces to new needs and functions, among other things through standardization and the reuse of building components. This flexibility enables quicker responses to changes in personnel size or operations, without being dependent on lengthy construction procedures or tight maintenance budgets.

The need for flexibility is significant: the current real estate does not sufficiently align with the dynamics of Defense and is often designed to be inflexible. A future-oriented approach, in which materials are seen as valuable resources and reuse is central, is considered essential. This also offers clear added value; flexible, circular, and industrial buildings can save costs, be realized more quickly, and contribute to sustainable material use with lasting economic value.

Flexibility must be anchored at multiple levels. At the strategic level, it involves the ability to relocate or dispose of buildings. Tactically, it revolves around the flexible use and value retention of buildings and materials. Operationally, it concerns direct adjustments within buildings, such as moving walls or other minor adjustments like door configurations.

At the same time, there are significant risks. Flexible solutions prove not to be always reliable in practice and are limited by a strong short-term financial approach. Rigid regulations, bureaucracy, and external factors such as ecological legislation pose serious obstacles to implementation. Without changes in these conditions, the desired flexibility will be difficult to achieve. The challenge thus lies not only in designing flexible real estate but also in creating a supportive organizational culture and policy environment.

Conclusion

Through the results of the interviews, answers are provided to the sub-questions 1 and 2:

1. How is flexibility and remountability interpreted within the RVB and Defense in relation to IFR construction? Approached from the perspective of advisors, managers, and practitioners.
2. And, what new insights about flexibility emerge from the interviews with experts?

The synthesis of the interviews is tested against the initially stated hypothesis, namely that circular construction, and specifically the application of flexibility (F) and remountability (R) within the IFR construction method, can function as a strategic tool to make Defense real estate more agile and resilient in light of political and economic uncertainties. Based on this testing, the research continues regarding the results that answer the following sub-questions.

The synthesis follows the same themes as the description of the results, namely the meaning of, the necessity of, the added value of, the level of, and the risks of flexibility in the portfolio. These results are analyzed based on the previously described literature study. The synthesis concludes with a reflection on the hypothesis.

Overarching analysis

The meaning of flexibility

For this synthesis, the exposition of flexibility made by Geraedts et al. (2014) is used, consisting of organizational, process, and product flexibility.

Organizational flexibility - Each group identifies the organization as a serious bottleneck. It is precisely at this point that flexibility should be created, so that space is generated elsewhere to facilitate. However, the bureaucratic and traditional character of Defense makes it difficult to bring about change in this regard. There is also a lack of the necessary management and vision to actually make that change possible. This analysis corresponds with the behavior of real estate users, who are also not very flexible and cling to familiar working methods.

The interviewees regularly emphasize the importance of Total Cost of Ownership (TCO) in this area and identify obstacles in the current organizational structure. The interpretation of visions varies: from physical adaptability by multiple advisors, to the mobility of building parts by managers, to cultural change processes primarily proposed by advisors and need stakeholders. These structures limit the ability to quickly respond to changing operational requirements and external circumstances.

The absence of a TCO approach leads to choices that seem logical in the short term but are detrimental in the long term, such as avoiding strategic vacancy or ignoring residual value. This undermines the structural flexibility of the real estate portfolio because the organization does not operate data-driven, and thus does not have these issues under control.

The missing control translates, for example, to the absence of necessary temporary housing. The 'sliding puzzle' is difficult to organize within the existing structures. Although hybrid working partially solves space issues, this is limited to administrative functions. For operational components, physical spaces are essential. As a result, real estate is expected to be flexible enough to ensure business operations during (re)construction.

For Defense, organizational flexibility means adopting an agile attitude. This requires a TCO approach, which, according to several respondents, is not feasible in the short term due to slow decision-making within the government. Organizational flexibility is therefore primarily identified as a bottleneck: there is a lack of change capacity and strategic insight.

Process flexibility - Managers primarily reason from the process. From their perspective on the issue, the standardization of construction tasks and the concept of flexibility are approached as a kind of Lego block approach: by cleverly combining standardized elements, one can switch faster. Standardization is seen as a key to more efficient processes. Uniform designs limit the space for customization but increase predictability and speed up turnaround time. Flexibility in this context does not mean maximum freedom of choice, but rather strategically arranging limited choice space at the beginning of the process.

This vision contrasts with that of the advisors. They primarily see the architectural and technical challenges associated with the standardized approach regarding flexibility and often consider these difficult to achieve. From their perspective, the essence of flexibility lies more in the building itself, in product flexibility. Nevertheless, for managers, it is primarily the process-related benefits that count: time savings and quality assurance across the entire real estate portfolio.

Time is, by the way, a central factor, also for advisors and needs assessors. Due to the triennial changes of commanders, priorities and visions constantly change. This is at odds with the long lead times of real estate projects, leading to inefficiency, frustration, and waste, a point particularly emphasized by the needs assessors.

Although managers see the most gain in the process, others additionally point to an often overlooked form of flexibility: that after delivery. Adaptability and function changes are rarely structurally accounted for. Circular design principles, such as disassemblability, are occasionally applied but are only effective when explicitly included in design and procurement with a central goal. An additional challenge is the diversity of local regulations; what is allowed in one location may not apply elsewhere. For an organization with many dispersed locations, this makes developing generic, flexible processes extra complex.

Product flexibility - The most tangible form of flexibility lies in the building itself. It is at this level that advisors particularly see the benefits of flexibility. A distinction is made between flexibility in use, physical adaptability, and disposability. The strategic ability to dispose of real estate is widely shared as a goal.

Opinions on how physical adaptability should be achieved differ, even among the advisors themselves. Some consider small adjustments, such as movable walls, sufficient; others advocate for structural possibilities for function changes, such as being able to convert a building from office to barracks.

Modularity reappears as a key concept, but at the same time brings an internal conflict. On the one hand, it is said that by using standardized 2D and 3D elements, a "Lego building method" is created where components can easily be added, moved, or reused. This increases scalability, speed, and reusability, provided that mobility is included in the design. On the other hand, this is met with skepticism by some advisors. Advisors particularly emphasize functional robustness as essential. By designing buildings without a fixed function, they can flexibly respond to changing needs.

The context of barracks as an urban planning whole complicates this; functions cannot simply be moved due to interdependencies and spatial logic. Not every building is equally suitable or justified for investments in flexibility.

Finally, the advisors mentioned the trend towards larger, multifunctional buildings. Overdimensioning is not seen as waste, but as a strategic choice for future adaptability. This requires a vision on residual value, reuse, and investment logic. Something that is currently lacking.

In short, regarding the meaning of flexibility, there is still no clear vision or definition shared by advisors, management, and needs assessors. There is an idea about it, but so far, they have not been able to align it among themselves. A lack of organizational flexibility is unanimously identified as a bottleneck.

The necessity for flexibility

Flexibility is consistently recognized by all three parties as a key principle in making the real estate portfolio of the Ministry of Defense future-proof. This involves not only the physical adaptability of buildings, such as expandability or reconfiguration, but also functional flexibility, the ability of a

building to fulfill multiple functions throughout its lifespan. This broad view of flexibility aligns with the need to respond to a fundamentally uncertain future with a clear and shared vision. Changing geopolitical relations, personnel fluctuations, material shortages, and administrative reorientations require real estate that can be adapted quickly, purposefully, and with value retention.

These adjustments often impact the entire organization, of which real estate is only a part. This raises the question among all parties of how much real estate should contribute to flexibility. Where is the boundary between the 'product' and the entire organization? From a traditional perspective, real estate is generally not very flexible. However, by incorporating flexibility into the real estate strategy, a better balance can be found.

This discussion places the real estate task within the Ministry of Defense not merely in the light of process optimization or governance issues, but within a broader design philosophy in the product. By investing in adaptability and disassemblability, the Ministry of Defense invests in strategic freedom, the freedom to change when necessary, without having to reinvent the wheel each time and go through the same process routine.

The real problem, as identified by advisors and needs assessors, is not only that the real estate policy is slow and reactive, but that it is based on a static model in which buildings represent an endpoint of decision-making. This model does not take into account the dynamics of an organization like the Ministry of Defense, which constantly deals with changing (geo)political situations, fluctuations in personnel needs, technological innovations, and societal demands. Real estate designed according to traditional principles functions more as an anchor than as a lever within this context, is the assumption.

In short, this means that the necessity for flexibility does not only imply faster decision-making or more efficient procedures, but also embedding flexibility in the design and execution of real estate itself. By applying adaptive capacity, real estate can not only be better adjusted, redistributed, or dismantled when the situation demands it, but also creates broader strategic agility in real estate provision.

The added value of flexibility

Interviews reveal that, of the added value as defined by Den Heijer (2011), financial added value is currently the most important criterion for assessing the Ministry of Defense's real estate plans. Advisors indicate that there is hardly any focus on strategic, facility, and utility value, while flexibility influences all these areas. The advisors approach the added value of flexible building through the extended lifespan of real estate, as it better adapts to changing needs.

The interviews indicate that the role of real estate management within the Ministry of Defense is supportive, not directive. Policy choices lie with the ministry. However, this does not preclude the possibility of strategic thinking within the implementation practice, at the Rijksvastgoedbedrijf (RVB) and DVM. But the use of TCO models, scenario thinking, and a targeted focus on flexibility, through which real estate policy can contribute to the organization's objectives and thus provide added value in strategic, financial, utility, and facility value, is a policy issue.

All three parties emphasize that flexible real estate makes it easier to divest or outsource non-critical facilities. This aligns with the concept of building as a service, where ownership and operation lie with external parties, allowing the organization to focus on its core tasks. However, according to interviewees, this is not yet feasible in the short term. In particular, participants from the Ministry of

Defense indicate that this is not in the organization's 'DNA' and is also a policy issue.

In short, the interviews reveal that the Ministry of Defense currently primarily focuses on financial added value in real estate decisions. Flexibility in real estate is seen by advisors as a way to add value in all areas, particularly through the longer usability of buildings. The integral application of tools such as TCO models, scenario thinking, and flexibility strategies is insufficiently embedded in policy. Flexible real estate can contribute to greater agility, but according to the interviewees, there is currently a lack of both a policy basis and cultural willingness within the Ministry of Defense.

Flexibility at strategic, tactical, and operational levels
From both the needs assessors, managers, and advisors, it is evident that flexibility must be shaped at three levels: strategic, tactical, and operational. The synthesis of the interviews is made at these three levels.

Strategic level - At this level, flexibility appears to be a complex and not yet fully crystallized concept. All three parties recognize the need to shape real estate portfolios in a way that withstands long-term developments, and the necessity to do this at a strategic level. At the same time, it becomes clear that there is uncertainty at this level regarding the desired degree of flexibility and the ways in which it should be realized. This lack of a shared strategic vision makes it difficult to make unambiguous choices, for example, when it comes to investments in buildings that need to be flexibly adaptable. Where flexibility is recognized as strategically valuable, there is often a lack of concretization in terms of operational principles or clear evaluation frameworks, causing strategic ambitions around flexibility to not or only fragmentarily translate into concrete real estate decisions.

Tactical level - At this level, flexibility is taken up much more explicitly and actively. In procurement practice, for example, there is indeed a focus on aspects such as the mobility and adaptability of buildings. The possibility of modular construction of buildings and later adapting or relocating them is used as a means to manage risks and respond to future changes. Also, the 'ordering' of buildings from the factory, with the aim of enabling quick assembly on site, demonstrates a tactical orientation where flexibility is pragmatically used to increase operational effectiveness. Here, flexibility is not only seen as an abstract value but primarily as a concrete design and execution task that must take shape within current operations. At the same time, within this tactical level, there is a search for a balance between flexibility, functionality, and cost-effectiveness, where the context and usage expectations have a significant influence on the final choices.

Operational level - Here, flexibility is primarily visible in the way existing buildings and facilities are managed and adapted to changing needs. Examples of this include adjusting office layouts to new work forms or the rapid repurposing of spaces in response to changing operational requirements. Operational flexibility focuses primarily on the daily usability of real estate, with an emphasis on usage flexibility; the ability to meet changing user demands without major structural modifications. This level is characterized by a strongly reactive approach, where flexibility is mainly a means to support agility and efficiency in operations.

In short, although the interviews clearly indicate that the organization actively wants to utilize flexibility at the tactical and operational levels, the analysis shows that the strategic aspect of flexibility is still underdeveloped. Here, a mismatch arises. There is a gap between strategic thinking and operational execution. Managers think in terms of medium to long-term developments but lack

clear translations to the tactical and operational levels, where the actual real estate decisions are prepared and executed. At the same time, there are cultural and organizational barriers that complicate the approach to flexibility. The central policy real estate management in The Hague does monitor the direction, but the actual implementation and use of real estate largely lies with executing organizations such as DVM, which primarily operate within their operational frameworks and where there is a lack of tools to work with flexibility.

Risks associated with flexibility

The synthesis of the three perspectives shows that the risks associated with flexible real estate are rooted in both substantive and structural factors. Advisors point to practical limitations within existing barracks complexes, the lack of market capacity, legal obstacles, and the difficulty of politically legitimizing investments with a long payback period. Managers particularly emphasize the uncertainty about future needs and the risk of quality loss when reusing materials or modular components. Practitioners add that flexibility often fails due to a short-term vision, rigid regulations, and an organizational culture that complicates change. Collectively, these perspectives demonstrate that the risks are not only technical or financial in nature but also stem from policy inertia, culture, and system limitations, which significantly complicate the realization of flexible real estate.

Topic / Dimension	Advisors	Managers	Needs Assessors	Areas of Agreement / Disagreement
Overall view of flexibility	Focus on **product flexibility** (physical adaptability, modularity, residual value) as the core of strategic flexibility.	See flexibility mainly as **process efficiency** (standardization, "Lego-block" construction, time savings).	Emphasize need for flexibility to handle frequent command changes and shifting priorities.	All agree flexibility is crucial for Defense real estate, but they interpret it differently: product vs. process vs. organizational.
Organizational flexibility	Identify as key bottleneck; stress TCO approach and data-driven management to enable change.	Agree it is a bottleneck; note slow government decision-making.	Also see lack of organizational change capacity and rigid culture as major obstacles.	**Consensus:** organizational flexibility is the weakest link and urgently needed.
Process flexibility	Skeptical of heavy standardization; worry about architectural/technical limits; highlight post-delivery adaptability and local regulatory barriers.	Strong proponents of standardized, modular "Lego" methods for speed and predictability.	Highlight time issues: 3-year command rotations vs. long project cycles; value post-delivery adaptability.	**Partial agreement:** all value faster processes and adaptability after delivery, but advisors resist over-standardization while managers embrace it.
Product (building) flexibility	Central priority: modularity, multifunctional design, disassemblability, overdimensioning for future use.	Secondary to process benefits; modularity only as it supports speed and cost control.	Support physical adaptability to meet changing operational requirements.	**Agreement:** product flexibility is important, but managers downplay it compared to process gains.
Strategic level	Want explicit integration of adaptability into long-term real estate strategy; stress need for clear vision and evaluation frameworks.	Recognize strategic importance but lack clear translation to operations; focus more on medium-term efficiency.	Share strategic concerns but see persistent gap between policy and implementation.	**Consensus:** strategy is underdeveloped and poorly connected to tactics/operations.
Tactical level	Support modular procurement and relocatable buildings, but with attention to functional robustness and reuse.	Actively pursue factory-built, quickly assembled modular buildings.	Value pragmatic measures for future changes.	General agreement on tactical use of modularity, but advisors caution against neglecting long-term adaptability.
Operational level	Stress day-to-day usability and easy space repurposing.	Focus on process improvements for daily operations.	Emphasize need for quick reconfiguration for shifting missions.	All agree operational flexibility is essential, mainly reactive.
Added value of flexibility	See flexibility adding **strategic, facility, utility, and financial** value through extended lifespan.	Ministry focuses mostly on **financial value**; managers follow that priority.	Recognize broad added value but note financial dominance in decisions.	Agreement that current policy overemphasizes financial metrics; advisors push broader valuation.
Risks & barriers	Note legal obstacles, market limits, political difficulty of long payback, complexity of barracks context.	Highlight uncertainty of future needs, risk of quality loss with reuse/modularity.	Stress short-termism, rigid regulations, and resistant culture.	All agree risks are technical, financial, and especially cultural/organizational.

Table 1: Schematic overview overarching analysis.

Reflection on the hypothesis

The initial hypothesis was that circular building, and specifically the application of flexibility (F) and remanufacturability (R) within the IFR construction method, not only contributes to sustainability but can also function as a strategic tool to make Defense real estate more agile and resilient in light of political and economic uncertainties.

From the synthesis of the interviews, it appears that the urgency for flexible real estate is widely shared among the different groups. At the same time, it emerges that there are varying interpretations of what flexibility precisely entails and how it should be concretely shaped. These differences are particularly visible at the strategic level, where the gap between ambition and practical implementation is the largest.

Advisors primarily define flexibility as the physical adaptability of buildings. This approach differs from the more process-oriented perspective of managers. This indicates that the effectiveness of flexibility as a strategic tool is also dependent on the extent to which the physical adaptability of real estate is controlled and structurally integrated within the broader real estate strategy. Due to the concrete and well-founded arguments from the advisors to consider the adaptability of buildings as the most relevant form of flexibility for the real estate portfolio, it has been decided to explicitly integrate this into the refined hypothesis, which thus forms the basis for the further developed framework.

The focus shifts from a general assumption about strategic value to a more specific approach to the physical adaptability of buildings as a prerequisite for strategic flexibility.

Refined hypothesis: *Real estate contributes to strategic flexibility when it is designed with adaptive capacity and realized according to the construction principle of Industrial, Flexible, and Remanufacturable (IFR). This allows it to effectively respond to changing organizational and external circumstances.*

6.2 Framework

This chapter outlines the development of a practical framework that integrates expert insights and literature findings to translate flexibility concepts into portfolio strategy. The chapter first defines the scope of the framework, then describes its construction and elaborates on its cost and value dimensions.

The description of the framework concludes with a summary that answers the third sub-question of the thesis: how can a framework be developed that translates these (expert) insights into the portfolio strategy?

The purpose of the framework is to provide a structured decision-support tool for strategic real estate management within the Ministry of Defense. It is designed for use by portfolio managers, policymakers, and project teams who are responsible for aligning real estate investments with long-term operational strategy in the context of the standardization-strategy with the IFR building method. The framework supports these stakeholders in identifying where and how flexibility can be embedded in their real estate portfolio to enhance adaptive capacity, reduce long-term costs and create strategic value.

Scope of the framework

In the previous chapter, another interpretation of flexibility was also mentioned, that of outsourcing. This leads to principles such as 'building as a service' (BaaS), 'energy as a service' (EaaS), or renting properties outside one's own premises. The model presented in this chapter focuses solely on the internal real estate flexibility of an organization, and not on these external principles (Figure 8). This approach and strict separation primarily stem from the ongoing desire/requirement of the Ministry of Defense to have real estate in its own ownership and management. By explicitly limiting the framework to internal flexibility principles, the analysis aligns with the Ministry of Defense's ownership requirements and ensures a focused exploration of organizational control and strategic responsiveness.

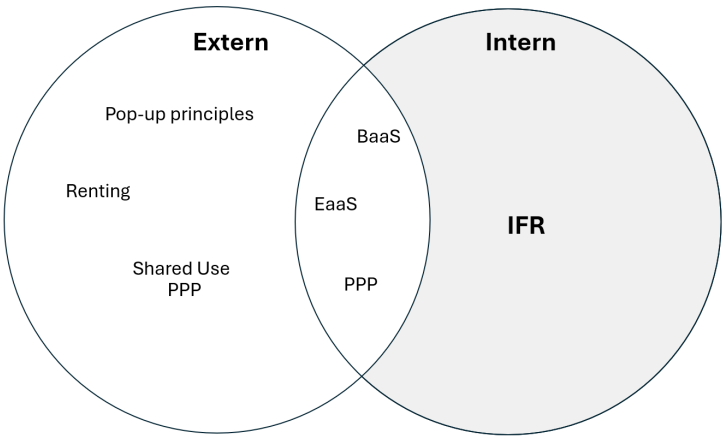


Figure 8: Distinction between external and internal flexibility principles.

The interviews also emphasize the distinction between internal-functional flexibility and external-physical flexibility. This concerns the organization's own real estate, which is either adapted within its own walls or outside its own walls. Nevertheless, the practical applicability of this flexibility at the portfolio level primarily lies in the domains of process and organizational flexibility. It is

noteworthy that standardization within processes actually lays the foundation for flexibility in both product and organization. For organizational flexibility, it is essential that the real estate organization has control over its own structure and management.

Framework Construction

The goal of this flexibility is to facilitate an agile business operation and strategic restructuring. Real estate must be able to respond quickly while maintaining strategic and/or financial value or even increasing value. The interviews indicate the potential of the IFR construction method, which possesses circular properties due to its remountability nature. If well designed, IFR can meet the adaptive capacity as defined within the assessment tool of Geraedts et al. (2014). The FLEX 4.0 model evaluates physical flexibility on a five-class scale based on weighted scores across 12-32 indicators. Higher scores indicate greater capacity for adaptation, such as expansion or relocation.

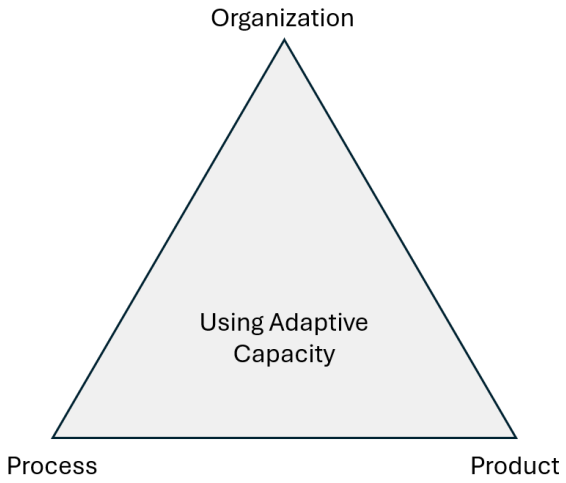


Figure 9: Using Adaptive Capacity is balancing Organization, Process and Product.

The interviews reveal the bottleneck for the use of flexible capacity. The interpretation is that this arises from the lack of 'control' the organization has over flexibility. Physical possibilities alone are insufficient; a flexible organization is necessary. The triangle in figure 9 illustrates the trade-offs that must be balanced in any project, programme or strategy regarding using flexibility. It shows that you can't optimize all three constraints at once, improving one usually impacts the others. A high score on the model of Geraedts et al. (2014) does not provide an advantage for a portfolio without an appropriate organizational and process structure. There lies the key to connecting strategic, financial, usage, and facility added value, at the building level, object level (military base), and portfolio level. The better the organization and process is structured around this adaptive capacity, the more added value can be realized with a flexible real estate portfolio that responds to changing business operations and strategy (see figure 10).

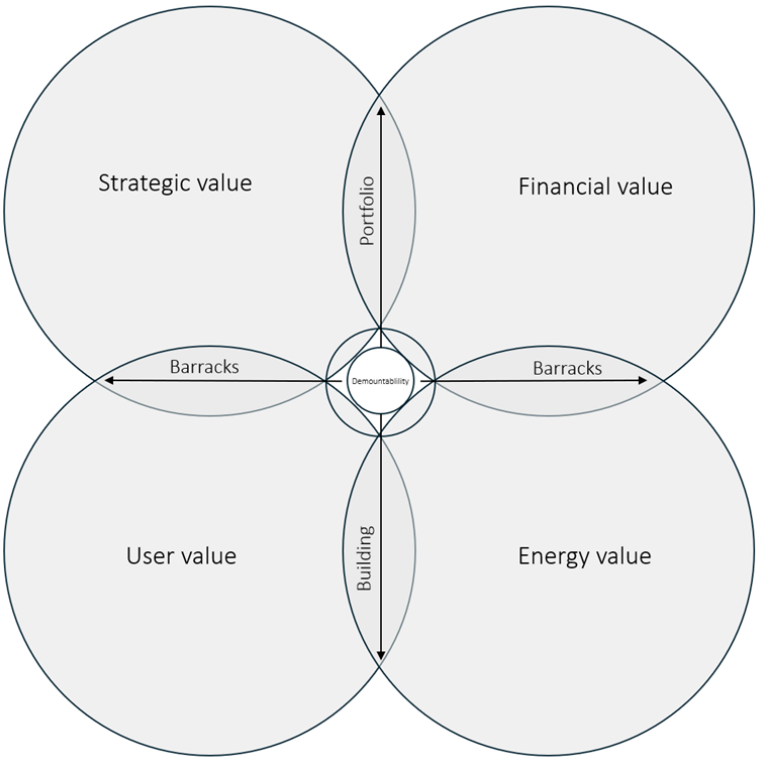


Figure 10: Basic model around added value flexibility regarding building, object, portfolio, and Adaptive Capacity.

In its simplest form, building according to the IFR construction method implies that a building is demountable (the central circle). However, within the current culture of Defense, where buildings are used long after their technical lifespan (without insurance or depreciation), this demountability means little. Only when there is actual control over the timing and manner of dismantling and reuse (for example, sale) does a form of added value arise. Without that control, the object remains within the boundaries of the second ring of figure 10. Also, adaptive capacity measures in the product, such as redesign, expansion, contraction, or relocation, cannot cross this boundary without organizational and process support, and thus do not enter the realms of building, barracks, or portfolio flexibility.

To effectively deploy flexible capacity, active steering must take place. This steering must be interdisciplinary and occur over time. For example, the design of a building with future functional use in mind requires close collaboration between urban planners and market managers. The more it is organized and aligned with stakeholders, the greater the value creation in the four spheres represented by the arrows in the model. Process flexibility (see figure 11) plays a crucial role here: the more standardization within IFR buildings, the product, and the organization, the faster and easier it becomes to create value. Additionally, there is a need for spatial policy freedom to make adjustments at the location level. Uniform regulations for Defense areas, across all municipalities, could significantly enhance the creation of added value.

Total Cost of Ownership

In the image below, the degree of Total Cost of Ownership (TCO) is also represented. Positive elements can also be included, such as the residual value of the real estate upon sale. This approach represents the most basic and direct form of cost determination. The image thus shows the dimension of process flexibility as a factor in TCO calculations.

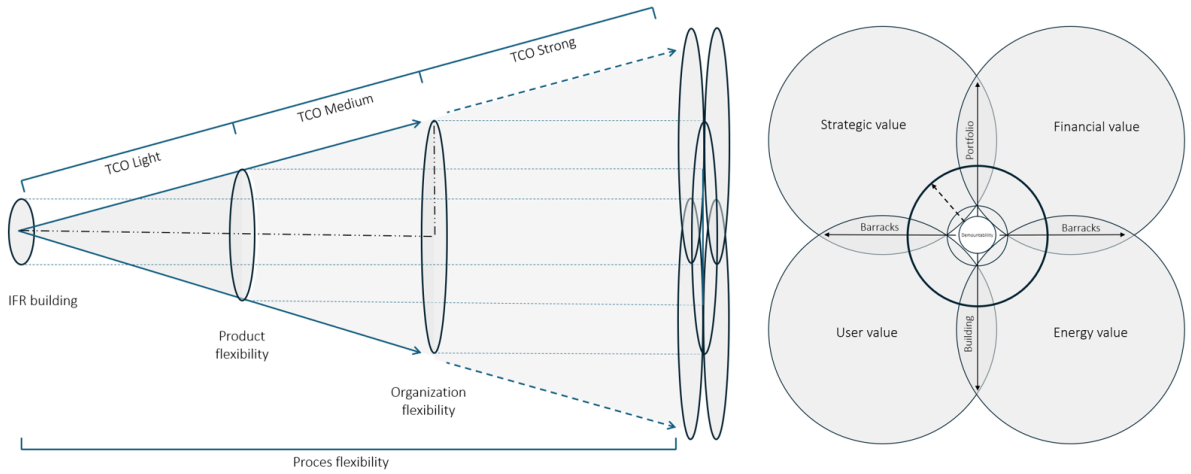


Figure 11: Degree of TCO calculation and process flexibility as the third and fourth dimensions.

The model distinguishes three levels of TCO integration.

- **TCO basic** focuses mainly on direct investment and operational costs.
- **TCO medium** incorporates broader organizational considerations, capturing the impact of flexible capacity over time.
- **TCO strong** integrates organizational flexibility, allowing the organization to actively leverage flexibility for value creation.
  This progression shows that as organizational steering increases, so does the potential to realize strategic and financial benefits.

However, a critical note can be made with the 'Pareto principle', or the 80/20 rule, which is rightly cited by Ellram (1994) in her paper on TCO. This states that 80% of the consequences arise from 20% of the resources. This principle can be applied in two ways in this context: first, 80% of the actual use of adaptive capacity could come from just 20% of the provided capacity. This raises questions about the value of a high flexibility class if there are costs associated with it. Second, from the perspective of value creation: possibly 80% of the realized added value comes from just 20% of the measures taken. This raises the question: what is the ratio of the added value in a TCO calculation when we weigh all costs and benefits in this way?

Although the 'Pareto principle' remains a theoretical model, it can serve as a useful thought experiment to somewhat temper the tendency towards excessive optimism in TCO calculations.

Added Value

The starting point in this approach is the real estate portfolio and the strategic and financial added value associated with it. The underlying assumption is that the R-ladder provides an effective framework in this context to increase financial added value, precisely because it is directly linked to enhancing strategic added value, as argued in the previous section. The ability to respond flexibly to trends, which can be taken into increasingly larger contexts, creates value on both fronts (see figure 12).

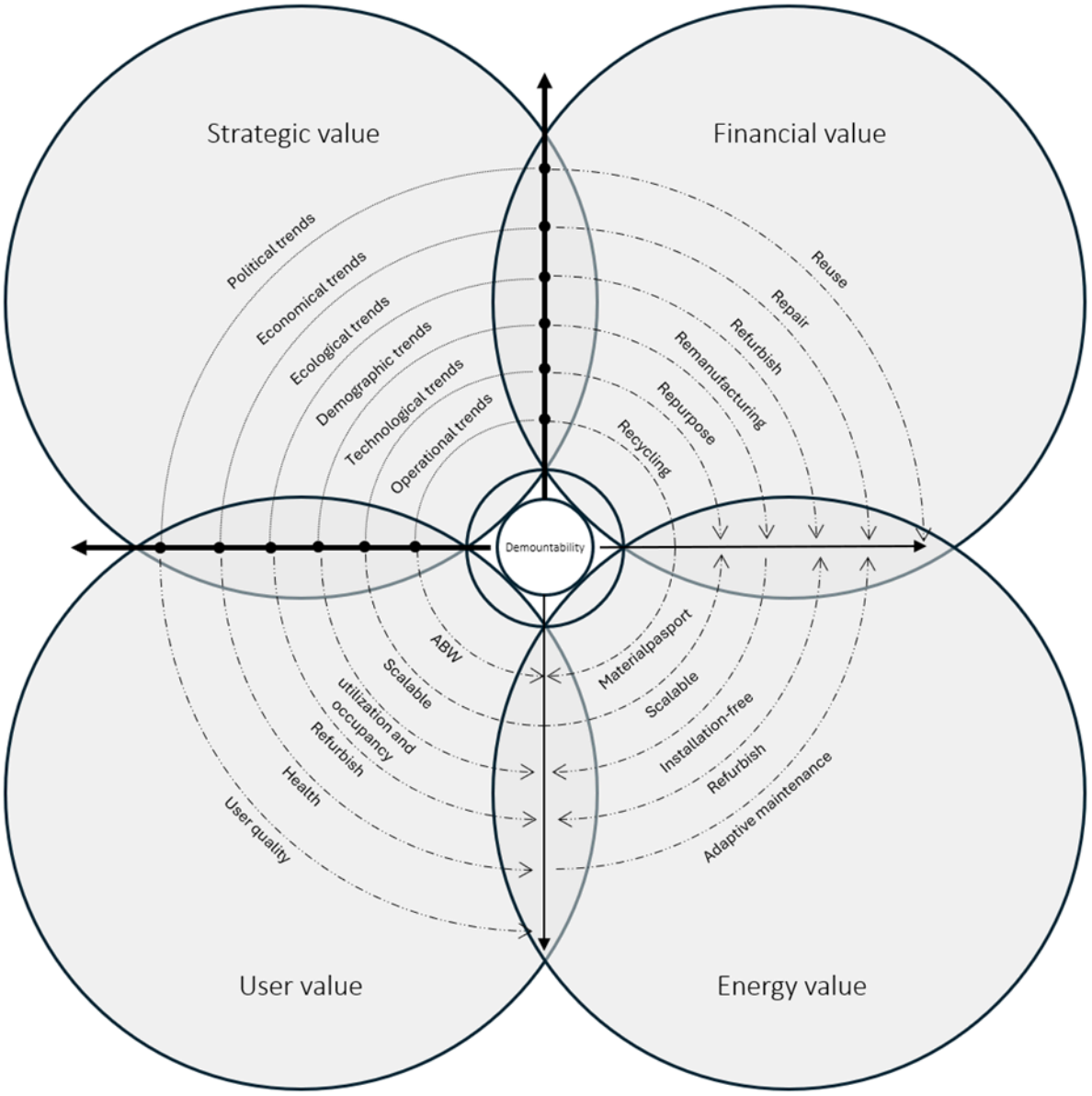


Figure 12: Scales of added value in organizational flexibility.

From a project management perspective, the 'iron triangle' can be applied to further support this argument (see figure 13). Although the 'iron triangle' is traditionally used in regular project realizations, it is also relevant here for adaptive projects. The triangle states that quality within a project can primarily be formulated in terms of time, cost, and quality. In this case, a demountable building, equipped with a degree of flexibility classes (adaptive capacity), forms the center of the triangle.

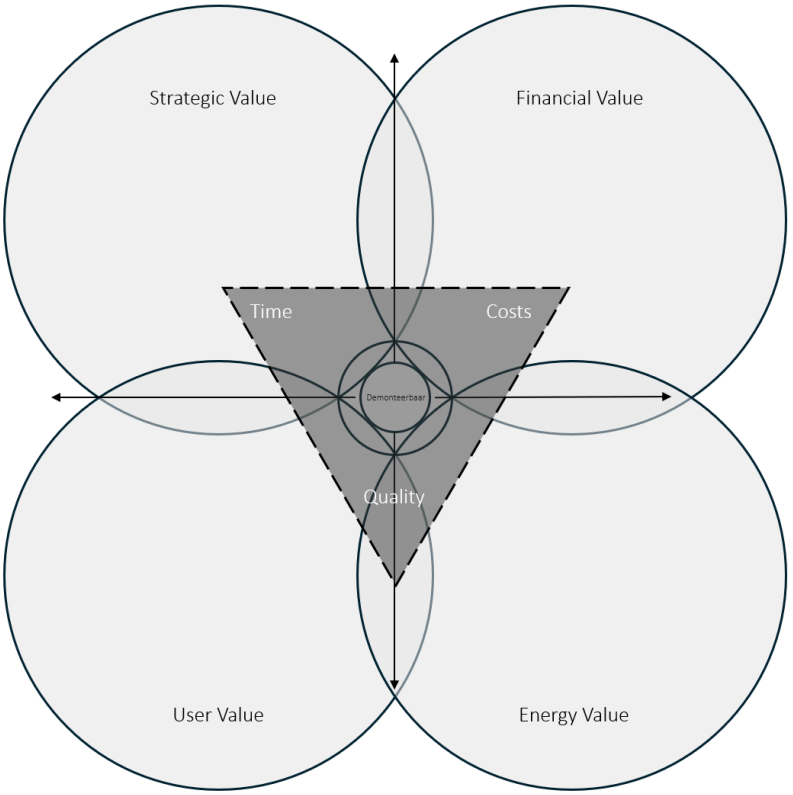


Figure 13: 'Iron triangle' within the basic model.

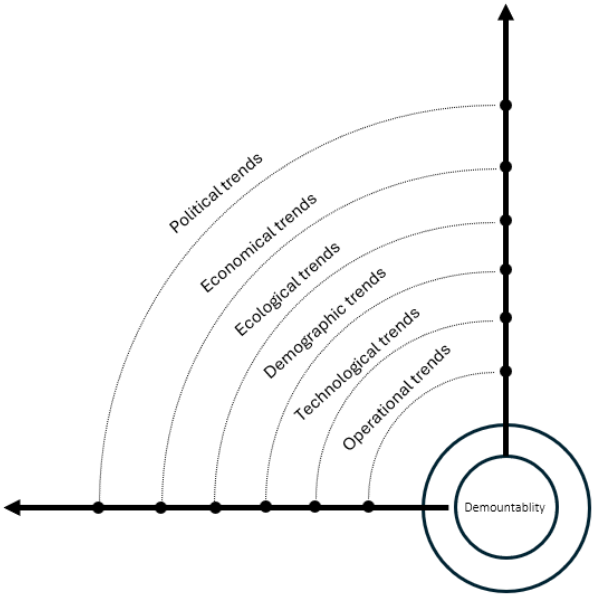
Within an organization such as Defense, time and cost take precedence. This is driven by the necessity to respond to changing trends within limited time and with minimal financial resources. Quality, defined in terms of maintenance, safety, and health, plays a less prominent role in this consideration. However, this can lead to new problems, such as the loss of attractiveness as a workplace, causing young and new personnel to stay away.

All aspects within this dynamic are closely interconnected: problems in one area inevitably have consequences for other areas. The organization plays a crucial role in this. The greater the degree of control over one's own organization, the better value can be retained or created.

In the area of facility and usage added value, there is no direct framework specifically linked to the organization of flexibility. In the definition from the image, facility added value is particularly described as a combination of cost savings and ease of use, where the overlap between quality and cost is clearly reflected, as also visible within the 'iron triangle'. The next section will further explore the different scales from figure 12.

The organization of added value

The four quadrants all share the same central starting point. However, the organization of the flexible capacity to create added value in each area is different. In some cases, the degree of organization translates across multiple quadrants.

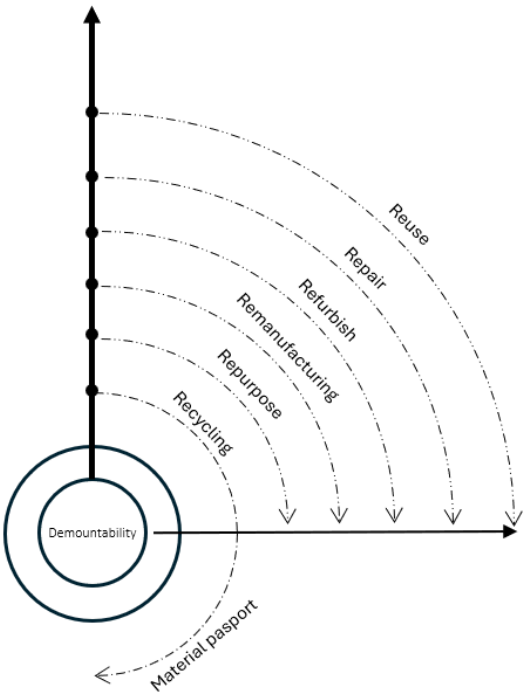


Strategic added value

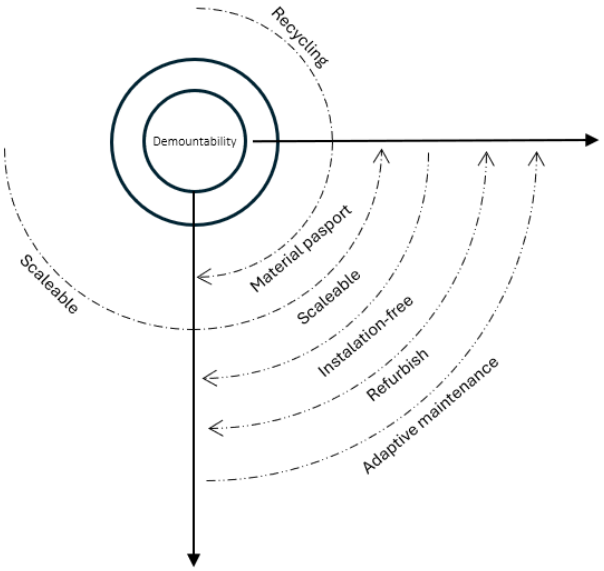
The strategic added value arises from the extent to which an organization can organize itself adaptively to respond to trends that cause changes in operations. The most basic form of these trends is internal operational trends, such as the shift from multi-person to single-person governing rooms. In these cases, cause and effect lie within the organization itself, allowing for targeted responses. As the focus shifts further to external trends, it increasingly revolves around organizing adaptability concerning external influences. The greater the added value derived from this, the more global and complex the organization of this adaptability must be. At the same time, as the trends move further away from the organization, the influence of Defense on these trends decreases. Strategic added value focuses not only on limiting risks but also on seizing opportunities presented by trends. While strategic added value focuses on adaptability to trends and operational shifts, financial added value reflects how this adaptability translates into measurable economic outcomes.

Financial added value

The financial added value of adaptive capacity is based on the principles of the R-ladder. Circular construction methods are not only employed for sustainable goals but also for strategic and financial purposes, which are included in TCO calculations. The focus is on the six usage strategies of the R-ladder, where 'recycling' and 'reuse' represent the extreme forms. Depending on the trend being responded to, this application can take place both internally within the organization and externally in the broader market. Internally, 'recycling' can be interpreted as reusing loose materials for new constructions or applications, while 'reuse' refers to the repurposing of complete structures within the own real estate portfolio. When these principles are applied beyond the organizational boundaries, the financial value is also dependent on the development of the



circular market, which is currently still difficult to predict. Financial strategies are closely linked to facility-level decisions, where technical adaptability and service infrastructure enable or constrain the economic potential of flexible real estate.



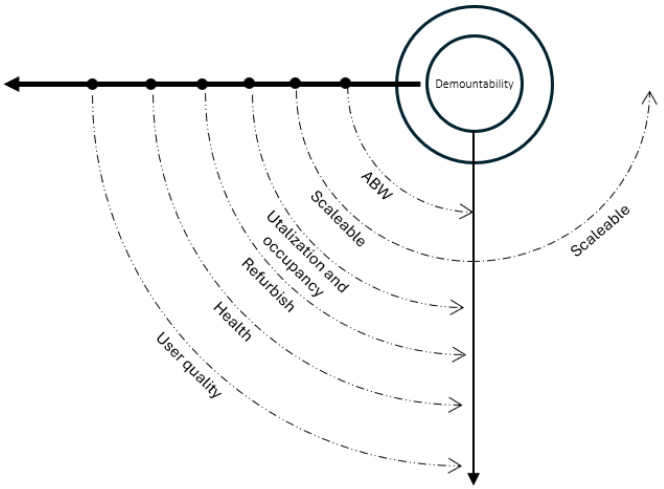
Facility added value

The facility added value and the corresponding scale in the model are largely based on the interpretations from the interviews. The first two scales directly follow from the added value scales for use and finance. For high-quality recycling, a materials passport is necessary, and the scalable nature of functional spaces translates one-to-one into the installation technology and other service-oriented components, which must also be scalable. This is where the so-called quick wins lie. Although the definition of this is relatively simple, it proves challenging in practice to realize a low-installation construction process on a large scale within a standardized approach. To consistently score well on use added value, particularly in terms of health and comfort, the context in which construction takes place is crucial for the feasibility of a low-installation concept.

However, the biggest challenge lies in the organization of adaptive maintenance. This requires a high degree of thoughtfulness in real estate design, a solid measurement strategy to monitor performance, and the ability to make informed decisions about what needs to be replaced and when, always with value creation as the starting point.

User added value

Activity Based Working (ABW), supplemented by the scalability of its implementation, constitutes an important source of quick wins within the use of added value. This scalability can be further enhanced by actively managing utilization and occupancy, for example, by monitoring whether meeting rooms are actually being used by personnel entitled to them. A central recurring theme in this context is refurbish, especially considering the wear and tear of buildings and resources within an organization like Defense. Refurbish can



be seen as a fundamental component to maintain the value of real estate and facilities. The approach is two-dimensional: on one hand, sustainability plays a role, with reuse and value retention at the center; on the other hand, it concerns the operational availability of real estate and the continuous organization of revision and maintenance. In this latter approach, it is essentially about structural maintenance, but for an organization like Defense, it is essential to integrate this into every aspect of the process surrounding value creation in organizational terms.Finally, health and quality of use are included as additional measurement criteria for use added value, based on the GPR Building model (Building Revolution, 2025).

Use of framework

The model is intended to be used as a practical decision-making framework in situations where strategic and operational changes require adjustments to the real estate portfolio. Typical applications include capacity planning, location strategy, lifecycle replacement and transformation projects. It is particularly relevant in scenarios where long-term ownership is required and organizational agility is necessary to anticipate or respond to changing defense tasks. By clarifying the required level of flexibility at the building, base and portfolio levels, the model helps decision-makers prioritize investments and choose appropriate interventions.

In practical terms, the model can be applied in four steps:

1. **Assess** the current flexibility level of the asset using the flexibility indicators of Geraedts et al. (2014).
2. **Determine** the required agile organization based on strategic and operational scenarios the asset(s) need to adapt to (use strategic value quadrant).
3. **Match** the required capacity and organizational flexibility with the processes needed and TCO considerations to identify the most effective interventions. Ask oneself how flexible should the assets be? How flexible should the barracks be? How flexible should the portfolio be?
4. **Implement and monitor** the selected measures to ensure they deliver the expected value over time.
   This structured approach helps ensure that flexibility investments are targeted, measurable, and aligned with organizational goals.

The research shows that building-level flexibility, whether expressed as demountability or full remontability, has little strategic value unless it is embedded in organizational structures and supported by both process and product flexibility. Managers emphasized process efficiency and standardization, advisors highlighted physical adaptability and needs assessors stressed the necessity to respond to shifting operational demands. All agreed, however, that organizational flexibility and a Total Cost of Ownership (TCO) approach are essential foundations. The model therefore visualizes the cumulative relationship between value creation and organizational capacity, and product and process flexibility, demonstrating that each layer must be integrated before real strategic benefit emerges. By linking these elements across the scales of building, barracks, and portfolio, the model offers Defense and Rijksvastgoedbedrijf a practical tool for aligning strategic ambitions with tactical and operational reality. It enables policy makers, real estate managers, and project teams to identify where investments and management attention will genuinely enhance flexibility and long-term value, turning what might otherwise remain a technical possibility into an organizational capability with measurable impact.

To apply the framework effectively, several organizational prerequisites must be in place:

- **Valuation of real estate** must be integrated into accounting structures to financially justify flexibility investments.
- **Interim locations or plans** are required to maintain operational capacity during transitions.
- **Active land position management** ensures spatial and permitting flexibility.
- **Regulatory readiness**, including sufficient permitting space, minimizes delays during adjustments.

Together, these conditions enable the organization to translate physical adaptability into strategic and financial value.

Conclusion

This chapter has answered the third sub-question: how a framework can be developed that translates expert insights into the portfolio strategy of Defense. Based on interviews and literature, a model has been developed that focuses on internal real estate flexibility, with a sharp distinction from external principles such as 'building as a service'. The model shows that physical flexibility alone is insufficient to realize structural added value. The actual bottleneck lies in the lack of control over organizational flexibility: the extent to which an organization is able to manage, utilize, and adapt its real estate.

Standardization is a key to flexibility in both process and product. The integration of TCO calculations shows that higher investments in flexibility can pay off in the long run, provided the organization actively manages this.

In conclusion, the framework demonstrates that physical adaptability only generates strategic, financial, facility, and user value when it is embedded in an agile organizational structure and supported by process standardization. For Defense, this implies that investments in flexibility must be matched by investments in governance, planning and organizational capacity.

Ultimately, the framework serves as a decision-support instrument for Defense and Rijksvastgoedbedrijf, enabling them to align strategic ambitions with operational reality. It is designed to guide real estate managers, policymakers, and project teams in making well-informed, future-oriented investment and portfolio decisions. By clarifying when and how flexibility adds value, the model transforms abstract flexibility concepts into actionable strategies.

6.3 Focus Group

In this chapter, the results of the focus group are discussed, where the previously defined flexibility concepts from the framework have been tested against two scenarios. The documents provided to the participants are included in the appendix.

The Focus Group results conclude with a reflection on the previously refined hypothesis, which also answers the fourth sub-question of the thesis: how is the framework experienced by stakeholders in the focus group?

Outline of the Scenarios

The Ministry of Defense is currently working on a new Strategic Real Estate Plan (SVP 2025), in which, considering recent geopolitical developments, a renewed real estate strategy is formulated. This strategy is based on the principle of real estate retention: nothing is divested, and the aim is to operationalize all locations as quickly as possible. Within this plan, three scenarios are developed: the current scenario of a 'cold war', an escalation scenario ('war'), and a future scenario in which geopolitical peace has returned ('peace').

The first scenario addressed is situated within the overarching scenario of 'cold war', the context in which we currently find ourselves. The second scenario is focused on the overarching scenario of 'peace'. The 'war' scenario has been excluded due to the high degree of unpredictability and complexity it entails. Responding to trends within this scenario goes beyond the objective of this thesis.

The established scenarios were presented in advance to the coordinator of the Rijksvastgoedbedrijf on behalf of the Ministry of Defense, with the question of whether they could be considered realistic and appropriate. The response was positive: the scenarios were assessed as realistic and deemed suitable as a basis for further elaboration in the focus group.

Scenarios

The scenarios have been developed based on the intersections of likely trends. From these intersections, an 'extreme' situation has been constructed for each scenario. The complete elaborations of the scenarios, as presented to the participants, are included in the appendix. Below is a description of them.

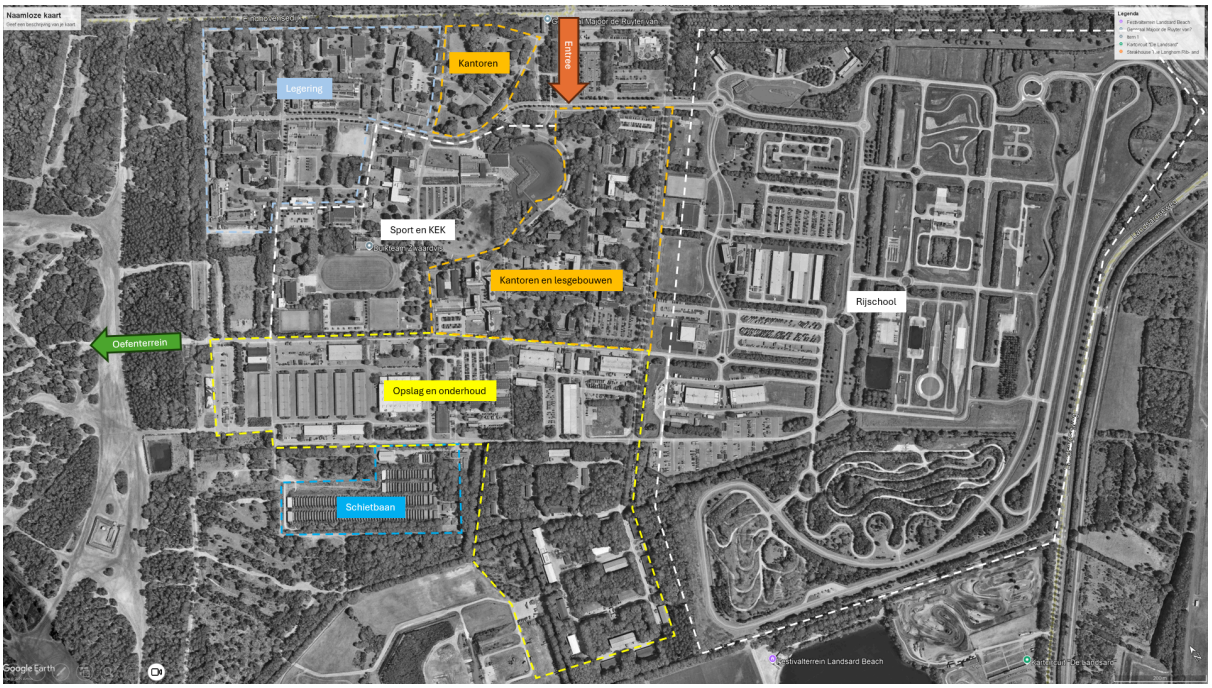


Image 1: Major General de Ruyter of Stevenincкkazerne in Oirschot.

Both scenarios apply to the Major General de Ruyter van Steveninck Barracks in Oirschot (see image 1). The following assumptions and starting points are provided to the participants for the scenarios:
For this exercise, it is assumed that all buildings on the barracks have been constructed according to the IFR principle: Industrial, Flexible, and Remountable, with full possibilities for:

- Reorganization / redesign of functions;
- Expansion or contraction of modules, both physically and functionally;
- Relocation of buildings or components, both internally (within the barracks) and externally.

The central assumption is that this construction method provides significant time and cost savings compared to traditional construction when it comes to adaptation or transformation. No additional real estate is being constructed: the focus is purely on the adaptive capacity of the existing real estate.
The following scenarios will be presented to the participants.

Scenario 1

Scenario 1 is shaped by technological and ecological developments. This scenario is based on the overarching scenario of the 'Cold War'. The following details are provided for the scenario:

It is 2035. Due to persistent drought, rising temperatures, and increasing climate instability, the risk of wildfires in the region around Oirschot has significantly increased. The location of the General Major de Ruyter van Steveninck Barracks, directly on the edge of the Oirschot heath, has become increasingly vulnerable as a result.

The KNMI has now designated the region of Brabant-Southeast as a 'high-risk area' for wildfires. This classification is based on a combination of factors: the dry sandy soil, the dense forest surrounding the Oirschot heath, the high likelihood of rapid fire spread in strong winds, and the limited firefighting capacity on site.

In response to these developments, nature managers, the Ministry of Defense, and environmental services have jointly established that all barracks bordering forest areas must maintain a buffer zone of at least one hundred meters free of construction on the forest side within five years.

For the barracks in Oirschot, this means that part of the current infrastructure, in this case, ten barrack buildings, is located within the newly established risk buffer. These buildings will need to be removed from their current location and relocated to another spot on the barracks, without expanding the site itself.

On the other hand, the forest area is not movable and cannot be cut down. It serves a crucial function as a water-absorbing area during extreme rainfall, is ecologically protected, and contributes to biodiversity, CO_2 storage, and cooling of the site.

Scenario 2

Scenario 2 revolves around demographic and internal operational trends. In this context, the overarching scenario of 'peace' is assumed. The following is given to the scenario:

It is 2035. The personnel size has not only structurally decreased but has also become significantly younger due to new inflow from the service year. Younger soldiers demand higher standards of comfort, privacy, and facilities on the site. However, there is hardly any work available at the barracks itself due to the implementation of the growth strategy of the armed forces during the Cold War period: training has been centralized, workplaces have moved to digital environments, and equipment maintenance is partially outsourced. The housing function has largely disappeared, while the demand for workspaces, ICT areas, and temporary workplaces has increased. These developments have fundamentally changed the traditional function of the barracks as a place where people live and work.

Barracking has largely become redundant. Most soldiers live at home or stay in the region and come to the barracks less frequently.

At the same time, there is a greater need for:

- Flexible, temporary workspaces for exercises, training, and deployment preparation.
- Technical workshops (think of assembly and maintenance of modern systems).
- ICT spaces and cyber environments, including for simulation, cyber exercises, and data analysis.
- The buildings that are currently set up for barracks are largely empty or underutilized.

Focus Group Outcomes

What stood out in both scenarios was the recurring tendency of participants to seek organizational solutions for spatial or functional challenges, rather than leveraging the potential adaptive capacity of real estate. When participants were 'forced' to explore adaptability as a solution direction, it became evident that they filled this with complex solutions of such an organizational nature that they seemed unfeasible in the short term.

Additionally, the factor at play is that both scenarios were based on a hypothetical situation in which the real estate is fully adaptive (which can still be defined as desired). In practice, the real estate portfolio is largely static and is expected to remain so for the coming decades, which makes this complexity in practice many times greater.

The discussions made it clear that adaptability, in theoretical terms, is a valuable concept for flexibility at the portfolio level, but its large-scale implementation is extremely complex for a desired outcome with value preservation or creation as a condition. Both organizationally and physically, at

the urban planning and architectural level, this requires a "clean sheet" approach: a completely new barracks, where flexibility is taken into account in the design and organization of the object from the outset. A common approach where real estate remains in ownership quickly leads to over-dimensioning and the development of concrete policies for remountable real estate with clear management.

The necessary preconditions for portfolio flexibility, such as standardized connections, potential for additional stories, or uniform roof shapes, are, no matter how simple it sounds, very complex at this scale. This seems to be outweighed by the complexity and abstraction of the task.

Outcome scenario 1 - Forest Fire Danger

In the first scenario addressed, a number of barracks buildings had to be removed due to the danger of forest fires. The discussion showed that changing the function from barracks to office within the standard concept is technically possible, but the reverse route requires much higher investments. Without these investments, there is only a one-sided functional adaptability. Normally, as studies show (Remøy & Van Der Voordt, 2014), such a function change is considered feasible, particularly in contexts where sales or housing market principles can support the transformation. However, in the context of a military base, where such market dynamics are not applicable, this does not hold true. This makes the 'function change' as a solution debatable.

Another important insight was that changing functions within a barracks cannot be done lightly. The interrelated urban planning relationships between functions, such as distances to sports facilities, kitchens, or classrooms, make a rearrangement complex, even if this is technically possible.

Shifting and combining functions as an overarching strategy remains. However, this requires more than just physical interventions; it calls for a reconsideration of the entire spatial-functional system.

It was suggested that in theory, considerations regarding the area development of the barracks could have already been made, such as grids and potential for expansion. The consensus was that this type of flexibility only works when there is a well-thought-out vision from the beginning, with attention to the oversizing of land position and construction, as well as organizational control. Particularly in this case, the initial construction of a barracks from a ‘‘clean sheet’’ would be necessary. Additionally, the question arose: how do you maintain control over the organization of relocating and combining functions, as well as control over the urban planning assembly? This is, after all, limited. Furthermore, this level of control is currently not within the capabilities of the organization. Currently, the sentiment often is: ‘‘who lives, cares.’’

Participants also noted that such restructuring rarely occurs, but that macro reinvestments in barracks can be realistic, for example, when an entire barracks changes function. In the example of Oirschot, it was mentioned that the current investment could change to a transport hub in a crisis situation. The discussion then turned to the question: do you want real estate to be relocatable or functions to be changeable in that case? The consensus was that within the current operations, changing functions on one's own premises is not desirable, unless on a large scale. In such cases, there is a preference for possibly divesting buildings and placing new buildings with the right requirements.

Outcome scenario 2 – Norm change and function loss

In the second scenario discussed, the barracks function largely disappears, partly due to changing norms. Once again, participants almost immediately thought of organizational solutions, such as temporarily relocating the secured shell and sharing buildings with external parties (for example, COA, student housing, or police).

It was also noted, particularly in this discussion, that financial considerations hardly play a role in decision-making. Real estate is seen as a one-time investment, and any subsequent benefits are considered incidental windfalls. Two solution directions emerged:

1. Collaboration with civil society, utilizing temporarily shared real estate.
2. Sale of buildings while retaining the land position, where remountability can help facilitate this flexibility.

The success of such solutions hinges on clear control, adequate permits, and a strategic vision. Since Defense is a political instrument, it remains vulnerable to policy changes. It was raised that built-in flexibility makes the organization sensitive to political shifts, but also more resilient to unforeseen developments. These two are at odds with each other.

During the discussions, the question indirectly arose: who is responsible for the control over flexibility, Defense itself or the Rijksvastgoedbedrijf? In many areas, this is clearly assigned, but when it comes to adaptive capacity, this is largely lacking. Flexibility requires the conditions, friction vacancy, scope stability, and possibly multifunctional spaces, according to Defense. At the same time, for many functions, such strict regulations apply that universally deployable buildings are often not realistic, according to Rijksvastgoedbedrijf. This specific knowledge and control currently lie with both parties and need to be clearly assigned if we want to talk about having the organization of flexibility "under control."

Standardization as a course also seems to have its limits in this context. In practice, it means: if you need 1100 m² but work with standard modules of 400 m², you get 1200 m², resulting in higher maintenance and energy costs. Additional costs for adaptive capacity are debatable. It remains difficult to justify an investment today that must exclude a future, uncertain investment.

Conclusion

The refined hypothesis was as follows: *real estate contributes to strategic flexibility when it is designed with adaptive capacity and realized according to the construction principle of Industrial, Flexible, and Remanufacturable (IFR). This allows it to effectively respond to changing organizational and external circumstances.*

The application of adaptability, as formulated by Geraedts et al. (2014), remains largely theoretical in practice when translated to the strategic portfolio level. Only in rare exceptions, such as in the case of a completely new area development ('clean sheet'), can these principles be integrated into strategic real estate development. However, this requires an extremely thoughtful vision, adequately organized approach, and tight control over the adaptive capacity of the real estate.

In contrast, remountability proves to be strategically relevant at the portfolio level, particularly for buildings that are not strongly Defense-specific. Since Defense wants to retain ownership of its real estate, it makes sense to actively steer towards these principles. Although leveraging remountability also requires vision, organization, and control, the necessary scale and complexity are significantly more manageable.

Instead of merely selling the object as material, it can be traded as functional real estate. This ensures value retention and potentially value creation in the future, according to recent research presented by a participant from the Focus Group (Ministry of the Interior and Kingdom Relations, 2025).

Oversizing, both in structural load-bearing capacity and functional design, can contribute to greater organizational agility. Local or small-scale fluctuations in space requirements can be accommodated in this way. Through scalable solutions for installations and furnishings, maintenance costs can be minimized.

Finally, the mobility of real estate in very unique cases could be an additional advantage of the remountability capacity that the IFR construction method possesses. However, this 'added value' does not extend much further than in times of crisis or war, where real estate with the same functions can be stacked (for this, oversizing of structural load-bearing capacity is necessary), thereby freeing up land for new real estate. In this exceptional scenario, this stacking should not lead to drastic interventions, such as adding an extra set of requirements (think of adding elevators, extra escape routes, etc.).

The above conclusion relates to the strategic and tactical level of flexibility. Here, strategic ambitions have remained relatively limited due to practical complexity, compared to the potential previously presented in this thesis. At the tactical level, more clarity has emerged among participants and the research from this thesis. It is also at this level, and the operational level, that Defense should initially focus. In particular, the prerequisites of an extremely thoughtful vision, adequately organized approach, and tight control are points that one must be aware of. After all, without a captain, a ship is of no use. At the operational level, adaptability, as presented by Geraedts et al. (2014), can indeed offer flexibility that can be valuable. However, these should deviate from the standardized real estate principle and be treated as a unique project. This means that flexibility can only be approached at the product level, and the stated hypothesis is not correct.

7. Conclusion and discussion

Conclusion

The central research question of this thesis was: *how can the IFR construction method contribute to flexibility in the real estate portfolio strategy of Defense?* To answer this question, four sub-questions were formulated. The results of these are summarized below.

How is flexibility and remountability interpreted within the RVB and Defense in relation to IFR construction?
Through the interview synthesis, it is clear that the need for flexible real estate is widely recognized by advisors, managers, and needs assessors. However, views on its implementation vary. Flexibility is understood both functionally and physically, with organizational and process factors also playing a significant role. This variation is most apparent at the strategic level, where the gap between ambition and execution is most pronounced.

What new insights about flexibility on added value emerge from interviews with experts?
Advisors predominantly define flexibility as the physical adaptability of buildings, whereas managers tend to emphasize a more process-oriented approach, which aligns with the original hypothesis. Given the strong and well-supported arguments from the advisors, the refined hypothesis now focuses on physical adaptability. This shifts the emphasis from a broad strategic value to the concrete design quality of buildings, which is crucial for effective strategic portfolio management.

How can a framework be developed that translates these insights on added value into the portfolio strategy?
Based on interviews and literature, a framework has been developed that emphasizes internal real estate flexibility, differentiating it from external approaches like 'building as a service.' The model highlights that physical flexibility alone is insufficient; the key limitation lies in the lack of control over organizational flexibility. Standardization of processes and products is a critical prerequisite. By incorporating TCO calculations, it becomes clear that higher initial investments in flexibility can be justified if paired with active organizational management. Only when physical adaptability is linked to organizational agility does true strategic, financial, and operational value materialize. For Defense, this means that investments in flexibility must be complemented by investments in governance, planning, and organizational capacity.

The framework serves as a decision-support tool for Defense and Rijksvastgoedbedrijf, helping align strategic goals with operational realities. It is designed to guide real estate managers, policymakers, and project teams in making informed, future-oriented investment and portfolio decisions.

How is the framework experienced by stakeholders in the focus group?
The adaptability model, as defined by Geraedts et al. (2014), proves only partially applicable at the portfolio level, except in exceptional cases like full redevelopments, which require a comprehensive vision and strong management. In contrast, remountability is seen as strategically relevant, particularly for generic buildings. Since the Ministry of Defense retains ownership of its real estate, it has an opportunity to guide its portfolio based on these principles. While this also requires organizational commitment, its scale makes it more manageable and better suited for integration into practice.

Answer to the research question

In conclusion, the research shows that deploying flexibility through individual adaptive buildings is challenging and difficult to implement strategically. Therefore, interpreting flexibility as the adaptability of individual buildings, as some advisors suggested, is not advisable. At the tactical level, this approach is hard to justify, and at the strategic level, the organization lacks the expertise to execute it effectively.

Strategic value from flexibility is more readily found in the ability to dismantle, reuse, or sell buildings when budgets decline, and maintenance or use becomes unfeasible. This allows the organization to retain land while divesting buildings. Moreover, as circumstances change—such as through technological advances, shifting business operations, or climate-related issues—space can be created for new buildings with different functions or needs. This not only provides strategic advantages but also financial benefits from the sale of buildings.

However, financial value can only be realized if the real estate meets civil quality standards, which the current Ministry of Defense structure does not fully support. Meeting these standards requires ongoing maintenance, consistent management, and proper accounting.

Ultimately, realizing strategic added value requires more than just flexibility. It requires a clear vision, defined frameworks, and robust portfolio management. Without effective management and strategic policies, the potential benefits of flexibility through IFR construction remain largely theoretical.

Discussion

Reflection on the process

The research process followed an iterative approach, in which literature review, empirical data collection and model development reinforced one another. The literature review laid the foundation for further exploration of the topic. By analyzing existing definitions and conceptual models related to flexibility, disassembly (remountability), and portfolio strategy, it became evident that academic literature aligns only to a limited extent with this specific context, let alone of the Defence real estate, highlighting the importance of insights from practice.

The interviews provided valuable depth and revealed the different perspectives present in the field. By distinguishing between advisors, managers, and needs assessors, it became possible to uncover variations in interpretation, urgency, and implementation capacity. This diversity required careful synthesis, focusing not only on shared views but also on the tensions and gaps between ambition and execution. This was quite complex, and also leaves room for other interpretations by researchers.

The development of the framework represented a translation of these insights into a model that could be applied strategically. This phase required a constant balance between abstraction and practicality. On one hand the model needed enough theoretical depth to structure flexible thinking, on the other remaining concrete enough to serve as a steering tool. Integrating elements such as Total Cost of Ownership (TCO), standardization and organizational flexibility was quite the challenge to also link physical design principles with strategic value.

The focus group was designed to test the model for relevance, usability, and feasibility in practice. This validation phase revealed mostly its limitations. For example, adaptability proved difficult to implement at the strategic level except in rare cases such as entirely new developments (“clean sheet” situations), whereas disassembly appeared more achievable at the portfolio level. The dialogue with stakeholders about adaptability was therefore not that much in depth as it was quickly considered unfeasible.

The entire process provided insight into the complexity of strategic flexibility within a context like Defence. The chosen structure allowed for reflection, iteration, and refinement, eventually resulting in a well-founded and broadly supported final advice to the Rijksvastgoedbedrijf en Defence which will be included in the development of the new strategic real estate plan of Defence.

Further research

The recommendation is to further investigate how the organization can be structured to optimally utilize flexibility in the real estate portfolio and strategy. In this sense, flexibility is about managing the acquisition and sale of buildings through the remountable nature of the building. The 'F' in IFR, regarding this research, stands for the management and organization of flexibility at the strategic level. Every ship needs a captain; it is essential that there is management within the organization regarding the maintenance and preservation of the real estate, so that the financial value is retained. This goes beyond just financial value; good management and maintenance also contribute to the comfort of use and the facility quality of the properties.

Therefore, it is advisable to better organize and strengthen the financial organization, with more steering power. This means, among other things, that it should be investigated how real estate can be accounted for in the books. Based on that, Total Cost of Ownership (TCO) calculations can be performed, which not only provide insight but can also serve as a steering instrument.

With a clear organizational structure and a strategic plan for utilizing the remountability capacities of real estate, the Ministry of Defense can flexibly respond to current challenges. This includes fluctuations in defense spending from the government, maintaining land positions when selling real estate, adapting to large and small-scale changes in operations, and keeping barracks attractive as workplaces for military personnel through systematic and thoughtful maintenance.

The advice is also to avoid focusing on flexibility at the building level within the Ministry of Defense. This has limited added value at the strategic level, particularly with regard to standardization. Focus on the organization of the remountability capacities of buildings. Treat the flexibility challenge as a strategic approach to a complete building as a product: a building can either remain intact or be sold (either as a fully functioning building or in separate materials).

Relocation within the own portfolio, for example to other barracks, is not a primary goal and is expected to occur rarely in practice. This may provide added value in specific scenarios, but should not be seen as the main objective. In the short term, it is advisable not to take this step towards the strategic level, as it represents a significant change within the current organization and brings many challenges related to local regulations. First, the Ministry of Defense needs to gain experience in buying and selling real estate, with a clear focus on value retention or value creation. This concerns not only financial value but certainly also strategic value.

Although the Ministry of Defense has expressed a desire to retain ownership of real estate, it may be worthwhile to further explore the benefits of models such as Building as a Service (BaaS) within the flexibility organization. The literature from Gibson (2001) provides a valuable guideline, categorizing real estate. Here, core real estate, which is owned, is central, surrounded by layers in which increasing flexibility is organized through contracts (BaaS), for example through variable notice periods. Moreover, the principle of remountability of IFR construction makes it possible to apply these models to the closed properties of the Ministry of Defense.

Further research should demonstrate how the strategic deployment of remountability of real estate relates to the quality of use. This insight is essential for the inquiries in tenders (consider, for example, the design of disassemblability), so that quality can be ensured, not only in financial and strategic terms but also in terms of use and facilities.

In conclusion the recommendations to the Ministry of Defence would be:

- Focus on the management of both the acquisition and sale of buildings.
- Ensure strong oversight of maintenance and preservation.
- Improve the financial organization by registering real estate in the accounts and applying TCO calculations as a management instrument.
- Develop a strategic plan to leverage remountability.
- Use flexibility to address budget fluctuations, property sales in response to changing needs, shifts in operations or technology, and to maintain the attractiveness and functional quality of barracks.

The recommendations to the Rijksvastgoedbedrijf would be:

- Do not advise on building-level flexibility with respect to strategic value.
- Do advise on the strategic organization of remountability by treating buildings as products that can be retained or sold, including material reuse.
- Do not prioritize relocation within the Ministry of Defence portfolio (such as moving buildings to other barracks).
- First, gain experience with the purchase and sale of real estate with a focus on value creation and retention.

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Appendix

Interview

Geinterviewden

Adviseurs	Leidinggevende	Behandelaars
RVB: Adviseur duurzaamheid, met specialisatie in circulariteit, technisch manager (BA)	**RVB:** Voorzitter programmateam Defensie (RVB)	**MvD:** Senior projectleider vastgoed Marechaussee
RVB: Programmamanager circulair bouwen en klimaatadaptatie, beleidsverantwoordelijk (CC)	**MvD:** Oud-afdelingshoofd programmamanagement bij DVM	**MvD:** Behoeftestelling behandelaar CLAS
RVB: Strategisch inkoopadviseur	**MvD:** Programmamanager en plaatsvervangend directeur transformatie vastgoed binnen de Afdeling Vastgoed van het Directoraat-Generaal Beleid	**MvD:** Behoeftestelling behandelaar CLSK
RVB: Adviseur programmering		**MvD:** Beheerder bouwprogramma (DVM)
RVB: Programmamanager van het revitalisering programma		
MvD: Militair bij RVB, adviseur relatiemanagement		
MvD: Strategisch adviseur DVM		
MvD: Vastgoed adviseur DVM		

Vragen

Op voorhand; het onderzoek richt zich op de 1.2 miljoen m2 nieuw-te-bouwen bvo.

Wat is uw rol in de vastgoedwereld van Defensie?

…

Gebaseerd op de ‘Routekaart Verduurzamen vastgoed Defensie’ is IFR bouwen een praktische wijze van bouwen, welke circulair is. Randvoorwaarden hierin zijn dat waardevolle materialen worden behouden, milieudruk wordt geminimaliseerd, toekomstwaarde wordt geborgd en circulair beheer mogelijk wordt gemaakt.

‘’We standaardiseren vastgoed en het is adaptief voor langdurig gebruik.’’

Wat is volgens u de aanleiding dat deze strategie in het leven geroepen is? Gericht op het adaptief vermogen van het vastgoed.

…

Flexibel zijn wordt ‘gekenmerkt door het vermogen om zich aan te passen aan nieuwe, andere of veranderende eisen’.

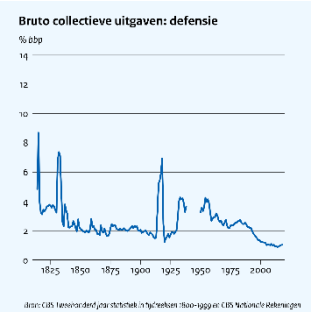
Wat betekent flexibiliteit voor u (vanuit uw rol in de organisatie) in een IFR bouwprincipe?

…

Zijn er andere termen die u eerder zou gebruiken dan flexibiliteit?

Aanpassingsvermogen, wendbaarheid, maakbaarheid, mobiliteit, modulariteit, robuustheid, veerkracht of veelzijdigheid.

…



Als we kijken naar de bruto collectieve uitgaven aan Defensie, dan is de term investering schommelingen terecht. Vanuit gaande dat er een tijd aanbreekt waarin investeringen wederom afnemen, hoe ziet u dan het gebruik van Defensie vastgoed veranderen?

…

Volgens Schneider en Hill (2007) zorgt flexibiliteit ervoor dat vastgoed zich kan aanpassen aan veranderende behoeften en patronen. Deze behoeften kunnen praktisch of technisch zijn. De veranderende patronen kunnen worden veroorzaakt door demografische, economische of ecologische veranderingen.

Vanuit uw rol in de organisatie, welke demografische, economische of ecologische veranderingen zouden moeten plaatsvinden om gebruik te maken van de ‘gebruikte term’ van het vastgoed? Hanteer hierin de betekenis van ‘gebruikte term’.

…

Wat is er voor nodig om dit tot stand te brengen? Denk hierbij aan data en organisatie structuren. Anders verwoord; op basis van welke feiten zou u, of zou u verwachten dat andere, een beslissing nemen?

…

Ziet u ‘gebruikte term’ op strategisch, tactisch of operationeel niveau in de organisatie?

…

Waar zou een object aan moeten voldoen om de eigen definitie van flexibiliteit te bereiken? (losmaakbaarheid, verplaatsbaarheid, vrijheid van inrichting, multifunctionaliteit)

…

Speelt de (toekomst)waarde van het object een rol in dit verhaal, en zo ja, in welke mate? (strategisch, financieel, gebruikers, of energie)

…

Wat zijn de gevaren/risico’s/nadelen als centraal in de vastgoedportefeuille strategie wordt gestuurd op flexibiliteit volgens u?

…

Quotes

Expertgroep - adviseurs:

De betekenis van flexibiliteit

Programmamanager circulair bouwen en klimaatadaptatie, beleidsverantwoordelijke:
‘’Flexibiliteit dat gaat dan over dat je makkelijk een gebouw kunt aanpassen, zowel intern als extern denk ik. …, dus bij de tweede gebruiksfase, hoef je minder te knutselen, heb je minder grondstoffen nodig. En er gaan sowieso functionele veranderingen komen, ook al denken we dat we het allemaal altijd kunnen voorspellen en zo, maar dat gaat sowieso gebeuren. Dus die flexibiliteit is in die zin belangrijk.’’

Adviseur programmering:
"Want je hebt denk ik de gedurende levenscyclus heb je echt de kleine aanpassing. Dat mensen denken, ik wil er een luifeltje bij. Het is net te klein. Het deurtje moet iets breder omdat anders voertuig je er niet in kan. Dus dat hou je denk ik toch. Het is natuurlijk wel fijn als je er van tevoren over nadenkt. Dat je net even iets overdimensioneert, dat er meer in kan. En je hebt natuurlijk echt grote aanpassingen. Dat je zegt, het gebouw moet zo flexibel zijn dat er een verdieping op moet kunnen. Of dat er een vleugel aan moet kunnen. Maar er zit ook nog een andere ding in. Wat we in het verleden best veel gezien hebben, is dat er een hele functiewijziging in kwam."..."Tot aan... Nou ja, gedurende, de levensduur van het

gebouw het meerdere keren uit elkaar kunnen halen en verplaatsen. Er zit ook nog een variant in met inderdaad het aanpassen van het object zoals het er dan staat voor een andere functie."

Strategisch adviseur DVM:
"Als we een ander woord zouden, dat containerbegrip flexibiliteit, een ander woord voor zouden moeten gebruiken, dan zou dat zijn aanpassingsvermogen."..."Aanpasbaarheid. Drager inbouw denk ik, van die Habraken, altijd second life denken."

Adviseur duurzaamheid, met specialisatie in circulariteit, technisch manager:
‘’niet zozeer zit in het voortdurend aanpassen van gebouwen, maar in het creëren van ruimtes die meerdere functies kunnen ondersteunen zonder fysieke aanpassingen.’’... ‘’Gebruikers moeten kunnen kiezen welke ruimte past bij hun activiteit (stilte, samenwerking, onderwijs, etc.).’’

‘’We zetten nu in op de hoofddraagconstructie om die te kunnen hergebruiken,’’ … ‘’het hangt wel af van hoe je je gebouw in elkaar zet, zijn het 2D of 3D elementen?’’

Programmamanager circulair bouwen en klimaatadaptatie, beleidsverantwoordelijke:
‘’Ja, dat verschilt natuurlijk wel een beetje per gebruiksfunctie. Dus voor die legeringsgebouwen daarvan, ja, daar moet het én losmaakbaar én verplaatsbaar zijn. Voor sommige grote gebouwen, ja, daar vraag ik me dus af of dat echt nodig is. Dus bijvoorbeeld alles in Den Helder, dus alles gerelateerd aan echt kritieke functies en unieke functies, zoals haven of vliegveld en zo. Ja, daarvan vraag ik het me af, dat hoeft ook niet per se verplaatsbaar te zijn. Maar de dingen waar je veel wisselingen in verwacht, dat moet wel ook losmaakbaar en verplaatsbaar zijn.‘’

Strategisch inkoopadviseur:
‘’Heel makkelijk een extra lokaal of ruimte bij of aanzetten of opzetten. Dat omvat het uitbreiden van de buitenschil van het gebouw. Technisch gezien kan dit betekenen dat het installatieconcept zo is doordacht dat een deel van een gebouw kan worden aangebouwd en dat het concept dan nog steeds voldoet, of dat de constructie wordt overgedimensioneerd zodat een extra verdieping mogelijk is.’’

Adviseur programmering:
‘’Want we bouwen niet meer voor het eerste gebruik, maar ook voor het tweede, derde, vierde gebruik.’’

Programmamanager van het revitalisering programma:
‘’of je investeert een beetje extra om het gedurende de levensloop nog verplaatsbaar en uitbreidbaar te maken. Daarmee vergroot je dus ook je flexibiliteit ten opzichte van een traditioneel gemetseld gebouw.’’

‘’En ik denk wel dat 3D ook nog makkelijker oppakbaar is dan 2D. Als je het vanuit het perspectief doet dat het gedurende de levensfase nog van plek moet gaan veranderen.’’

''Nou ja, ik geloof dus heel erg, die modulariteit, dat geloof ik wel, dat je vaste bouwblokken hebt, vaste eenheden, en dat je daar je, zeg maar even de Lego-blokjes, en dat je daar je gebouwen uit samenstelt.''

Programmamanager circulair bouwen en klimaatadaptatie, beleidsverantwoordelijke:
''Maar ik vind wel dat flexibiliteit is natuurlijk wel meer dan binnenwandjes verplaatsen, want je moet ook goed nadenken over … iets aanbouwen of opbouwen. Dan moet je ervoor zorgen dat je constructie dat aan kan dus dan moet je misschien overdimensioneren dan kom je bij het dilemma van dan ga je in eerste instantie meer materiaal gebruiken, nou dat vind ik natuurlijk vanuit circulariteit dan weer niet zo leuk, en de ander is dat het ook vooral intern, … , ja het meest flexibele dan zou je ook moeten gaan kijken, … ,naar bijvoorbeeld low tech oplossingen dus met zo min mogelijk installaties.''

Programmamanager van het revitalisering programma:
''Ik geloof ook heel erg in die fabrieksmatige bouw richting circulariteit en herbruikbaarheid''

''Volgens mij moet je flexibiliteit ook gewoon zien in dat je niet te veel maatwerk erin stopt.''

Adviseur programmering
''We hebben veel liever dat je een bouwdeel kan hergebruiken dan dat je de grondstof kan terug winnen.''

Strategisch adviseur DVM
''De mate waarin je flexibel wil zijn, is heel erg belangrijk om te bepalen.''...''de flexibiliteit van de gebruiker, ja dat is misschien wel het mooiste.''

De noodzaak van flexibiliteit

Adviseur duurzaamheid, met specialisatie in circulariteit, technisch manager:
''Bij Defensie zijn we (bij wijze van spreken) iedere dag bezig met reorganiseren.''

''Ze waren gewend om mensen de officier op een persoonskamer te leggen, de onderofficier op twee persoonskamers en de manschap op vier persoonskamers. Met minder sanitair, dus één toilet per vier. Nu krijgen ze allemaal één op één. Dus iedereen in één persoons kamer, allemaal eigen sanitair. … Als je vraagt wat kost dat meer, want we willen goedkoper zijn in exploitatie, dan gaan die investeringskosten omhoog. Maar nu is er binnen Defensie eigenlijk heel veel leegstand van bedden, …, Dat noemen we ghost sleeper. …, Daar betaal je wel voor. Dus je maakt eigenlijk 30, 35 procent te veel vastgoed. Als je iedereen een eigen kamer geeft, weet je gewoon zeker of de kamer altijd wordt uitgegeven. Er zijn geen excuses om een kamer niet te kunnen uitgeven. En je weet ook of die wordt gebruikt, want dat kan je gewoon meten. En ben je er niet, lever je je kamer in. Dus de investeringskosten per vierkante meter zijn hoog maar voor het niveau lange termijn gaat het veel geld opleveren. Je gaat minder vierkante meters maken, minder milieulasten, minder schoonmaakkosten, minder energiekosten. Het zijn hele ingewikkelde berekeningen, maar je moet er een beetje in geloven.''

Adviseur programmering

''Het is ook heel gek dat Defensie dit nooit gestandaardiseerd heeft, want alles binnen Defensie is gestandaardiseerd. Ik bedoel, het woord uniform zegt dat genoeg. Alles heeft een NATO stocknummer. Of het nou schoenen zijn, kleding is, een vergat is, een voertuig is. Alles is gestandaardiseerd, alleen het vastgoed niet.''

Programmamanager van het revitalisering programma
''Als je iedere keer een nieuw gebouw gaat maken, dan krijg je iedere keer de riedel van behoefte stellen, PvE maken, ontwerp maken, inkopen en uitvoeren. En dat is behoorlijk tijdsintensief.''

Strategisch inkoopadviseur
''Er zijn jarenlang te weinig investeringen in het vastgoed van Defensie geweest. De technische levensduur is gemiddeld best heel oud en de onderhoudsstaat is, laten we het zo zeggen, niet altijd even goed. Dit resulteert in veel geld dat wordt gestopt in onderhoud voor relatief slechte kwaliteit vastgoed, als een 'zwart gatpotje' van onderhoud''.

Adviseur programmering:
''Wat echt funest is voor een vastgoedportefeuille is als je niet meer genoeg geld hebt om het te onderhouden. Dus dat je minder gaat nieuw bouwen, oké, tot daaraan toe. Maar dat hebben we gewoon de afgelopen 20 jaar gehad of zo, dat er zo weinig geld was, dat je kwalitatief echt heel hard achteruit gaat.''

Strategisch adviseur DVM
''Ja, je kunt dus heel reactief zijn in defensie. Zie hoe lastig dat is, want je bent traag in het groeien en je hebt verwaarloosd wat je hebt. Dus je bent eigenlijk bezig met heel wat plakken van je oude meuk en daarnaast wil je nog groeien. Ja, kansloos.''

Adviseur programmering:
''Wij zijn heel erg gewend om te bouwen voor het eerste gebruik. Dus er komt het programma van eisen: we hebben op dit moment 33 voertuigen, 5 straaljagers en 40 mensen werken. Dus we bouwen gebouwen exact voor wat er nu nodig is. En dat is best wel gek.''...''Maar voordat dat staat ben je zoveel jaren verder. Op het moment dat het is opgeleverd, klopt het al niet meer.''

Programmamanager van het revitalisering programma
''Omdat men dan ook iedere keer vanuit een nieuwe situatie gaat denken van wat heb ik nodig. En vooral bij Defensie zijn de functies relatief eenvoudig. Dus de basisfunctie kantoor, legering, les. Dat kun je in een ontzettend maatpak gieten, maar dat maatpak is tegen de tijd dat het gebouwd is alweer achterhaald. Verloop bij Defensie is heel erg groot. Mensen gaan om de drie jaar hebben ze een nieuwe carrière stap, dus dan komt er weer een nieuwe mening.''

Militair bij RVB, adviseur relatiemanagement
''Het kan best ook nog eens een keer zijn dat gedurende die tijd de wisseling van de wacht is. En dat die nieuwe commandant weer roept, wat die vorige commandant heeft bedacht en verzonnen, dat is leuk en aardig, maar ik wil het nog anders. Oftewel, ga je weer terug naar

af.''...''maakt het eigenlijk denk ik alleen maar nut en noodzaak van dat flexibel en dat adaptieve maakt het alleen maar de urgentie alleen maar meer duidelijk denk ik''.

Programmamanager circulair bouwen en klimaatadaptatie, beleidsverantwoordelijk
''Het zit op twee, twee vlakken denk ik dat het... Wat je bijvoorbeeld... Dat heb je bij het COA gezien. COA heeft natuurlijk ook heel veel last van die politieke besluitvorming. Maar ik zou zeggen, ook over financiën. Gevangenissen, idem dito. Daar hebben ze dus te veel afgestoten in tijd dat ze dachten dat het niet nodig was. En je ziet nu eigenlijk dat dat ook vanuit euro's gezien echt super onverstandig was. (…) Maar goed, als je nu ziet wat er aan de asielcrisis is uitgegeven, dan zouden die paar jaar leegstand onderhouden echt peanuts zijn geweest. Hetzelfde geldt voor de gevangenissen. Dus ik vind wel dat je, zeker ook voor Defensie, dat dat echt wel verstandig is om daar op die manier over na te denken.''

Programmamanager van het revitalisering programma
''Hoe behoud ik mijn personeel? Dat is voor Defensie een hele belangrijke. Hoe zorg ik voor een prettige werkomgeving? Hoe zorg ik dat het een beetje aantrekkelijk is?''...''Je hebt ook technologische ontwikkelingen dat er andere afwegingen gemaakt moeten worden. Vroeger stonden de voertuigen altijd buiten. Maar voertuigen worden steeds meer rijdende computers dus die moeten gewoon binnen staan dus in plaats van dat ze onder een afdak of in de open lucht buiten staan moeten ze gewoon binnen staan dus dat betekent ook dat je ander vastgoed nodig hebt.''

Militair bij RVB, adviseur relatiemanagement
''Wat je vooral merkt natuurlijk, de opgedragen taken die Defensie heeft, wat je nu bijvoorbeeld ook ziet in hoofdtaak 1, je merkt dus wat betreft de geopolitieke ontwikkelingen, met name natuurlijk vanuit Rusland ingegeven, dat Defensie daarin sneller moet kunnen acteren en op basis daarvan ook het vastgoed snel moet kunnen inrichten.''

''Alleen die ontwikkelingen, die vragen van ons als defensie zijnde om daadwerkelijk regie en daadkracht. Oftewel, we moeten dus snel kunnen bouwen, we moeten snel kunnen acteren enzovoorts enzovoorts.''...''Denk bijvoorbeeld aan de hele stikstof discussie. Oké we willen sneller bouwen en prima, maar als we kijken naar bijvoorbeeld je milieumaatregelen, je stikstof enzovoort, ja alles zit al redelijk op slot.''

Strategisch adviseur DVM
''Vastgoed moet zich maar aanpassen, dat geloof ik wel.''

''Dan moet je je realiseren dat door de organisatorische wisselingen die je zelf doormaakt, wereldpolitiek, anders aankijkt tegen een gebied waardoor functies veranderen, dat je gewoon moet accepteren en moet inzien dat er heel vaak wijzigingen moeten worden doorgevoerd aan vastgoed.''

''Vastgoed is lomp, zwaar, dom en stevig. En dat kost dus geld.''

''De vraag zal er altijd zijn. Daar ben ik wel van overtuigd. Schaarste in grond zal er ook altijd zijn. En schaarste in materialen, mensen ook.''...''Dus maak het de eerste keer slim, zodat het aanpasbaar is.''...''Dus wij roepen nu ook heel hard op strategisch niveau om die

aanpasbaarheid in de tijd te faciliteren.''...''We roepen ook meer te kijken naar de bestaande markt. En aanhuren en aankopen wat er is.''

Programmamanager circulair bouwen en klimaatadaptatie, beleidsverantwoordelijk:
''Wat ik bij flexibiliteit denk, maar dat zullen misschien ook wel meer mensen gezegd hebben, moet je wel slim nadenken. Dat proberen we dus ook voor circulariteit, het gaat ook dus over ontwerpen voor de tweede gebruiksfase. Maar dat hoeft niet elke functie te zijn. Dus het is niet zo dat je elke functie mogelijk moet maken wat mij betreft in dat gebouw. En daar kun je wel slimmer over nadenken.''

Militair bij RVB, adviseur relatiemanagement
''Dan krijg je natuurlijk een beetje een kip-ei-discussie van oké mogen we nu al bouwen en daarmee die restricties voor onder andere stikstof terzijde leggen of zeggen we nee we houden ons eigen nu aan de regels zoals ze nu gelden alleen dat heeft dan voor consequenties dat bijvoorbeeld een bepaalde bouwproject enzovoort dat dat gewoon langer gaat duren''...''dus vandaar ook dat IFR bouwen en de standaardisatie, dat het daarvoor moet gaan zorgen''...''Adaptief in die zin dat de taken van Defensie veranderen, ook vooral op de strategische locaties enzovoorts.''

Strategisch adviseur DVM
''dat is in de krijgsmacht heel breed, want we hebben nu ook de grote uitdaging dat we niet ons arsenaal kunnen vervangen, maar we moeten ons bestaande arsenaal aanpassen.''...''Die investeringen om altijd maar te blijven aanpassen, dat is nieuw. Dat is echt de toekomst.''

''Grondpolitiek is echt ook bepalend voor dit soort dingen.''...''Het is Nederland, het is mooi druk aan het worden met z'n allen. Dat maakt je wel dat je veel flexibeler moet kijken naar vastgoed.''...''Ga er maar vanuit dat het er is en je moet het aanpassen.''

Adviseur programmering:
''Wat ik zag, we hebben de opschorting van de dienstplicht gehad. En wat je bij de dienstplicht had, was dat je heel veel relatief kleine gebouwtjes nodig had. Want elk clubje dat opgeleid werd, had een eigen gebouwtje. Als je die dienstplicht niet meer hebt, dan wil je eigenlijk iets anders. Dus je wil eigenlijk van heel veel kleine gebouwen en heel weinig grote gebouwen. Dat is een beweging die we hebben gezien.''

De meerwaarde van flexibiliteit

Programmamanager circulair bouwen en klimaatadaptatie, beleidsverantwoordelijk
Nou ja, kijk, het lijkt mij heel verstandig om die 10% meer kosten gewoon te gaan investeren. Want het, ja, nogmaals, het levert je dus geld op, het levert je minder gedoe straks op, je bent minder afhankelijk van, als je straks weer iets nieuws moet bouwen. Dat je dan weer defensiecapaciteit, RVB-capaciteit, marktcapaciteit, grondstoffen. Die hele bende heb je niet meer nodig. Want je hebt het allemaal al een keer gebouwd. Je hebt alleen maar, bijvoorbeeld voor zo'n legeringsgebouw, je hebt wel een vrachtwagenchauffeur nodig. Even heel versimpeld. Dat is echt iets anders. Dus ik denk echt dat die 10% echt peanuts is als je naar de toekomst kijkt.''...''Het levert dan eigenlijk echt alleen maar geld op, is mijn veronderstelling.''

Strategisch inkoopadviseur

''Hoewel dat maatschappelijke argument voor duurzaamheid en circulariteit belangrijk is, wil ik wel benadrukken dat het financiële argument meer helpt dan het maatschappelijke argument in besluitvormingsprocessen binnen de organisaties. Die lifecycle-kostenbenadering maakt de investering in flexibiliteit financieel te verantwoorden.''

Adviseur programmering

''Er zit waarde in en dat is nieuw. Ja om twee redenen. Eén de schaarste en de tweede je kan het verplaatsen, je kan het uit elkaar trekken.''...''Ik vind het voordeel als je hem op deze manier bekijkt, dan ga je er ook zuinig op zijn. Dan ga je er ook voor zorgen dat het goed onderhouden wordt. Want als je dat niet doet, dan zie je die waarde dalen.''...''Het zou wel een leuke nieuwe mindset zijn.''

Strategisch adviseur DVM

''Dus als je een kantoor bouwt, dan krijg je ook van de gemeente een tweede bestemming voor wonen. Wat is daar het effect van? Toen bleek, als jij dat van tevoren geregeld krijgt, dan is dat waardevol voor de investeerder. Want die weet, zijn leegstandsrisico's worden lager, over 20 jaar als we de volgende varkenscyclus hebben, kan ik zonder gezeik leegstand omzetten naar wonen.''

Adviseur programmering

''Dat we denken dat je het veel meer snelheid kunt maken. Dus dat je in ieder geval de echte bouwtijd, dus op de locatie zelf korter is, daardoor minder overlast. We denken dat het goedkoper is, we denken dat je minder materiaal nodig hebt. Stikstof kan je natuurlijk helpen. Als je eenmaal in die flow zit, dan plak je er allemaal voordelen op.''

Programmamanager van het revitalisering programma

''En het scheelt gewoon overlast op de bouwplaats. En daarmee wordt het ook nog eens schoner omdat een groot deel van je productie in de fabriek plaatsvindt. En je hebt die losmaakbaarheid dus aan het eind voor je circulariteit en dan even afhankelijk of je een beetje extra investeert om het gedurende levensloop nog verplaatsbaar en uitbreidbaar te maken. Vergroot je dus ook je flexibiliteit ten opzichte van een traditioneel gemetseld gebouw.''

Militair bij RVB, adviseur relatiemanagement

''Dus dat we sneller kunnen acteren, sneller dingen kunnen afroepen in tegenstelling tot de traditionele gebouwen''...''Op het moment dat je meer naar standaardisatie, prefab mogelijkheden gaat, ben je daar als Defensie veel flexibeler in. Dan kun je ook daarin sneller switchen op het moment dat de situatie je daarom vraagt,''

Adviseur programmering

''Ik heb het gevoel dat we nu een beetje voorlopen op de rest van Nederland in de utiliteitsbouw. Dat is natuurlijk ook wel leuk. Je kan best een trend zetten en laten zien dat het kan. En als de rest meedoet, dan is die qua uitwisselbaarheid natuurlijk ook weer interessanter. Er zit denk ik ook een schaalvoordeel in."..."Niet alleen in je bouw, maar ook

gewoon in de uitwisseling daarna.''...''Ja, en die zin heeft het los van deze (financiële) waarde, dus dat is ook maatschappelijke waarde.''

Programmamanager van het revitalisering programma
''waardoor je dus je grondstofuitputting met 80% beperkt, zou voor de maatschappij een goedkopere of betere oplossing kunnen zijn.''

Adviseur programmering
''Wat volgens mij ons het meeste helpt, maar dit kunnen wij niet oplossen, dat is gewoon een cultuurverandering binnen Defensie. Wij zijn heel erg gewend om te bouwen voor het eerste gebruik... Je zou ook kunnen zeggen, de Kromhoutkazerne vind ik dan een mooi voorbeeld. Die hebben gewoon een serie kantoorgebouwen neergezet, een serie legeringsgebouwen, een grote parkeergarage, een vergadercentrum, een bedrijfsrestaurant. En er werden defensieonderdelen ingezet. En je past je maar aan, dit is het vastgoed wat je hebt. Want we bouwen niet meer voor het eerste gebruik, maar ook voor het tweede, derde, vierde gebruik. En als dat je mindset wordt, dan hoeft het vastgoed minder flexibel als de organisatie flexibeler wordt. Daar zit volgens mij echt heel veel winst in.''

''En wat ook nog kunnen helpen natuurlijk is keuzes maken. Dat je multifunctionele gebouwen maakt. Dus gebouwen waar je je opslag, je voertuigen en je kantoren in kan stoppen. Ik denk dat die veel langer mee kunnen gaan. Veel makkelijker is wisselbaar natuurlijk in de functies.''

Flexibiliteit op operationeel, tactisch en strategisch niveau

Programmamanager circulair bouwen en klimaatadaptatie, beleidsverantwoordelijk:
''Als je het goed doet, doe je het op alle drie niveaus.''

Adviseur programmering:
''Ik zie hem vooral op operationeel niveau.''...''Je zou hem moeten willen op strategisch niveau.''...''Eigenlijk wil je dat op strategisch niveau afspreken. Alles binnen Defensie is gestandardiseerd, dus vastgoed ook. En we bouwen niet meer voor het eerste gebruik. We zetten het gewoon neer. Je hebt ermee te doen. Dat is natuurlijk echt een strategisch besluit.''

Programmamanager circulair bouwen en klimaatadaptatie, beleidsverantwoordelijk:
''Ik vind, omdat je het bijvoorbeeld remontabel maakt en daarmee meer kunt profiteren van de grondstoffen die je dan bijvoorbeeld uit je portefeuille kunt trekken en dat gaat steeds meer nodig zijn, gezien de grondstoffenschaarste. Op het moment dat je de remontabel maakt alleen dan kun je profiteren van restwaarde dus financieel gezien vind ik ook allemaal heel strategisch, meer strategisch eigenlijk strategisch tactisch, dus ja en tactisch en operationeel ja dan hebben we het op gegeven moment over binnenwandjes verplaatsen, dat is ook belangrijk.''

Programmamanager van het revitalisering programma:
''Wat ik er wel eentje voor flexibiliteit vind is overmaat creëren. Dus echt zorgen dat je deuren zo groot mogelijk maakt. Dat je net even het gebouw een halve meter meer hoogte

meegeeft voor werkplaatsen, voor magazijnen. Dat je hoopt dat het volgende voertuig er ook in kan.''

Strategisch inkoopadviseur:
''De markt vraagt vaak hoe flexibel wil je het hebben? Want wat zijn mogelijke scenario's die zich in de toekomst gaan voordoen om te bepalen hoe flexibel het moet zijn? Helaas ontbreekt het vaak aan een helder antwoord vanuit de opdrachtgever, er is gebrek aan visie. Dit is het issue dat het dus moeilijk is nu te achterhalen.''

Strategisch adviseur DVM:
''Dan zie je de spagaat tussen de oude kazerne, waarbij je de bestaande context als gegeven moet zien. Dan kun je niet modern gaan nadenken over de eerste ring van veiligheid, de tweede ring van veiligheid. Daar heb je toch te maken met context.''

''Op strategisch niveau heb je in de bestaande context moet je flexibel zijn om je ambities waar te maken en nieuwe nieuwbouwprojecten kun je precies maken wat je wilt dus dat is natuurlijk, iedere stad is product van de tijd.''

Adviseur programmering:
''Maar dat vraagt cultuur verandering. En wie heeft het lef om dat te doen? Anderzijds, als het nu niet lukt, dan lukt het nooit.''

Strategisch adviseur DVM:
''En als jij nu een centrale kazerne wil maken in Flevoland, kun je alles voor de eerste keer opnieuw doen. Je doet alles volgens IFR bouwsystematiek. Je maakt allemaal stempeltjes, en ideaal bouwen stempel je gewoon … wijziging doorgeven dus aanpasbaarheid in de tijd is gebouwniveau dat doel hebben we net besproken en dat is heel logisch op gebieds- en objectniveau, object is dan een kazerne.''

Risico's verbonden aan flexibiliteit

Programmamanager circulair bouwen en klimaatadaptatie, beleidsverantwoordelijk:
''Echt niet cynisch bedoeld, maar als je ziet voor de grote projecten in Nederland, ook voor infrastructuur en zo, dan heeft de maatschappelijke kosten-batenanalyse nooit de doorslag gegeven in het besluit. Dus beslissers beslissen toch altijd anders, ook al denken ze, en vinden ze, en willen ze dat graag op rationele dingen doen. ''

Militair bij RVB, adviseur relatiemanagement:
''Alleen dat vraagt ook tijd en capaciteit. Met name natuurlijk tijd en capaciteit. Dat is nu lastig om te bewerkstelligen. Dat je letterlijk en figuurlijk ook handjes tekort komt. De ambitie is hoog, het doel is hoog. Alleen daadwerkelijk de realisatie, zowel vanuit Defensie als vanuit de RVB, maar ook vanuit de markt. Dus de aannemers enzovoort die het straks moeten realiseren, de fabrieken die het moeten bouwen enzovoort. Iedereen zit een beetje in dezelfde vijver te vissen natuurlijk om mensen binnen te halen en ook om het daadwerkelijk gerealiseerd te krijgen.''

Strategisch adviseur DVM:

‘’Het is heel onzeker of je een nieuwbouw kunt krijgen.’’...’’Nieuwbouw, nou kijk maar, materiaalschaarste, mensschaarste. En nou hebben we nog moeten moeten willen we snelheid dus tempo schaarste door nou heel die complexe bureaucratie die we met z'n allen als professionals we hebben van bouwkunde een vak gemaakt om ons… terwijl het gewoon steen op steen is he, ja eigenlijk is het niet zo moeilijk he ja we hebben het wel moeilijk gemaakt dus dat is wel aan de orde en koester wat je hebt en kijk daarna wat je mist en dat moet je dus gaan aanhuren, aankopen, nieuwbouwen. Dat is het volgende ding.’’

Adviseur duurzaamheid, met specialisatie in circulariteit, technisch manager:
‘’Heel veel is niet te becijferen, er wordt ons heel vaak gevraagd; wat kost het meer? Maar die rekensom is echt heel erg ingewikkeld. Vaak wordt er dan toch weer alleen naar de investeringskosten voor het gebouw gekeken. Maar uiteindelijk wil je weten, wat doet dit voor de lange termijn op voorraadniveau, in de meest brede zin. Dus Total Cost of Ownership.’’

‘’Als je adaptief wilt bouwen, moet je iets maken wat geschikt is voor velen. Dat vraagt wel weer wat extra investeringen. Dat is ook nog een lastig punt.’’...‘’Als je zegt van in Den Helder hebben we acht lagen hoog nodig en daar moet het geschikt voor zijn. En dan koop je volgens een bouwsysteem wat gemaakt kan worden in Den Helder. Dat is natuurlijk een overinvestering op al die andere locaties.’’

Adviseur programmering:
‘’De schaarste van materialen wordt wel echt een probleem.’’

Programmamanager van het revitalisering programma:
‘’Deze is duurder dus wordt gewoon gezegd, die deur is te groot en we weten toch niet hoe groot de volgende wordt dus we gaan die grote deur gaan we niet doen. Gewoon puur om 10.000 euro te besparen.’’

Programmamanager circulair bouwen en klimaatadaptatie, beleidsverantwoordelijk:
‘’Nou de risico's zijn is dat er nog helemaal niet zo heel veel fabrieken zijn die dit kunnen bouwen.’’

Adviseur duurzaamheid, met specialisatie in circulariteit, technisch manager:
‘’Daarnaast zijn er risico’s op het gebied van regelgeving en toekomstige eisen, zoals gewijzigde normen voor verdiepingshoogtes of vloerbelasting, waardoor huidige ontwerpen op termijn niet meer bruikbaar zijn.’’

Programmamanager van het revitalisering programma:
‘’Ja, al je vergunningsprocedures en dergelijke die, wat in Nederland behoorlijk maatgevend is, die blijf je houden ook als je een gebouw gaat verplaatsen. Ja, tenzij je echt kiest voor een tijdelijk gebouw van vijf jaar.’’

Strategisch inkoopadviseur:
‘’Als een gebouw is opgeleverd als verplaatsbaar, maar na enkele jaren blijkt dit niet het geval, is de aannemer mogelijk niet meer aanspreekbaar als deze al vijf jaar weg is en er geen contractuele voorwaarden meer zijn.’’...’’markt is gemiddeld niet blij met dat soort open

eindjes in order portefeuilles, want daar hebben ze geen idee van hoe en wat en wanneer dan''... ''Dit kan leiden tot terughoudendheid bij inschrijvingen.''

Strategisch adviseur DVM
''En als jij ergens een woning maakt, mag er naast geen industrie zitten. Als je ergens komt wonen, dan kun je er naast geen industrie meer maken. Dat geldt op een kazerne precies hetzelfde. Naast een radardome kun je daar niet gaan wonen. Dus als er een woning is, kun je er geen radar naast zetten. Ook geen munitie. Dus het heeft behoorlijk wat impact.''

Adviseur programmering
''Wat volgens mij ons het meeste helpt, maar dit kunnen wij niet oplossen, dat is gewoon een cultuurverandering binnen Defensie.''

''Er zit gewoon heel diep in de cultuur dat, inderdaad wat je zegt, het blijft staan totdat van ellende uit elkaar valt. Er wordt nooit iets opgeknapt, of vrijwel nooit iets opgeknapt. Dat wordt altijd gesloopt en dan zetten we weer iets nieuws neer. Het staat ook niet in de boeken, dus het heeft geen waarde. Het staat op een locatie met een militaire bestemming. Dat staat vaak ook midden op de Veluwe, dus het is voor niemand interessant. Dus als je iets wilt verkopen, ja, dat is gewoon niks waard. Dus daar wordt ook niet op afgeschreven. Op het moment dat je het hebt geïnvesteerd is je geld weg. Dat is een beetje de filosofie.''

Militair bij RVB, adviseur relatiemanagement
''Nee, dat denk ik niet. Zeker dat laatste wat je zegt, oké en dan weer verkopen. Ja, nee, ons kent ons. Kijk, onze organisatie is natuurlijk zo, wij leven jaren van bezuinigingen, oftewel op het moment dat we het kunnen behouden. Dus oftewel, ja, dan gaan we niet zomaar zeggen van oké we hebben het nu even nodig en daarna gaan we het weer afstoten.''

''We hebben nu een horizon van 15 jaar. En wie dan leeft, wie dan zorgt. Dat is natuurlijk ook een instelling. Alleen onze ervaring is natuurlijk vanuit het verleden van ja je moet wel zorgen dat je ja behoudt wat je hebt en dan kun je beter gewoon duurzaam bouwen want wie weet zitten we de komende 50 jaar er weer aan vast daar merk je dat dat ja dat er ook wel een beetje spanning zat in ja ja.''

Strategisch adviseur DVM
''Voor vastgoed, voor defensie is de wereld onrust. Dat is natuurlijk sterk bepaald hoeveel ruimte wij nodig hebben of niet. En dat is nu iedere keer ingevuld door, ja, naar het eigendom denken. Wij hebben terreinen, die zijn verkocht, en dan gaan we weer terreinen kopen. Ja, dat is weer inefficiënt. Dingen worden dan weer gesloopt en dan gaan we ze daarna weer nieuwbouwen. Grond is de schaarste, denk ik altijd.''

Strategisch inkoopadviseur
''Het inbouwen van flexibiliteit, vooral verplaatsbaarheid, kan aanzienlijk duurder zijn. De kosten zijn geloof ik 15 procent hoger als je dat over de gehele portefeuille van deze opgave uitvraagt. Dit is een lastig punt als men niet zeker weet of en wanneer de flexibiliteit daadwerkelijk zal worden gebruikt, want voor die 15% kun je ook nu meer gebouwen bouwen.''

''Als extra kosten worden betaald voor flexibiliteit die nooit wordt gebruikt, rijst de vraag of overheidsmiddelen op een doelmatige manier zijn uitgegeven.''

Adviseur programmering

''Maar ik geloof er niks van dat we dit in de boeken opnemen. Dat zit zo in het DNA van Defensie dat we dat niet doen.''...''Defensie verzekert het ook niet. Ze verzekert überhaupt niks. Ze zeggen dat ze zo groot zijn dat de premies te hoog zijn.''...''het past zo niet bij de cultuur van defensie dat ik gewoon niet denk dat het gaat gebeuren. Gek he? Ja. Want er ligt wel een kans.''

Programmamanager circulair bouwen en klimaatadaptatie, beleidsverantwoordelijk

''Je geeft wel je, maar dat heeft een beetje met beveiliging te maken, het is denk ik wel minder molestbestendig in potentie, want je kunt het dus vrij makkelijk uit elkaar schroeven en je moet goede afspraken maken want het hele bouwprogramma ligt natuurlijk gewoon helemaal digitaal in zo'n fabriek.''

Expertgroep - leidinggevende:

De betekenis van flexibiliteit

Voorzitter programmateam Defensie:

''Ja flexibiliteit volgens mij kan je dan denken over korte termijn en lange termijn''...''Een andere term voor flexibel is denk ik aanpassingsvermogen.''

''De bouwstijl moet dusdanig zijn dat je er een meter bij zet, een meter afhaalt en een kwarts daar kan draaien.''

Oud-afdelingshoofd programmamanagement bij DVM:

''Dus het hele conceptuele denken is veel flexibeler en toekomstbestendig.''

Voorzitter programmateam Defensie:

''Dit product, het gebouw, dat dat in meerdere behoeftes kan voorzien. Dat is wat mij betreft flexibel''...''er verschillende functies in kunnen. Dan praat je niet over demontabel, maar dan praat je gewoon over van oké, ik schuif hem iets uit, kus hem iets op, schaal hem iets af. Het is een soort van luciferdoosje, wie je de hele tijd kan bewegen.''

Oud-afdelingshoofd programmamanagement bij DVM:

''Een heel adaptieve module, die groot en volumineus is, dat we ons achter het magazijn kunnen inzetten. Maar we kunnen hem ook als stallingen inzetten, kunnen er ook een lichte werkplaats van maken en we kunnen er zelfs een leslokaal van maken waar voertuigen in gereden worden waar men lesgeeft aan het voertuig. Dus verschillende toepassingen juist omdat we groot en robuust en toekomstgericht proberen te bouwen.''

Voorzitter programmateam Defensie:

''Flexibiliteit is wel overal toepasbaar, maar niet overal aanvaardbaar.''

Oud-afdelingshoofd programmamanagement bij DVM:

''Dat beleggingen op complexen, dus wie zit waar, nog wel eens wijzigt.''...''een restwaarde houdt … je een gebouw overtollig stelt dan ga je slopen of nou ja soms als het kan een functiewijziging als die adaptief is maar het behoudt ook een restwaarde.''...''standaard modules lego blokjes zeggen we wel eens om het duidelijker te maken kun je eigenlijk alles samenstellen''...''Gewoon niet een bouwsteen in stukken zagen, pas maken, want dan is het geen standaard bouwsteen meer.''...''die tussentijdse mutaties daarvan bij een groei op een later moment sneller kan faciliteren.''

De noodzaak van flexibiliteit

Voorzitter programmateam Defensie:
''Flexibiliteit is nodig vanwege technische ontwikkelingen en beleidsmatige ontwikkelingen, duurzaamheid, nul op de meter, dat soort dingen.''

''Specifiek voor Defensie zijn technologische ontwikkelingen zoals drones van belang, die heel wat anders zijn dan een tankwerkplaats en waar je daar toch wel op moet gaan richten. Wat brengt dat ons? En waar moeten we ons op dimensioneren?''

''Als de behoefte van Defensie er is om van traditionele oorlogsvoering naar semi-hybride oorlogsvoering te gaan, dan zullen wij ons vastgoed ook moeten aanpassen.''

''Als de grondstoffen steeds schaarser worden, dan maakt het ook niet uit wat de kosten zijn. De kosten halen we er toch wel uit. Het gebrek aan grondstoffen betekent dat circulair bouwen de sleutel is, want anders gaan we dit niet redden.''

''De complexiteit van waar en waarom er gebouwd wordt, wordt steeds ingewikkelder vanwege zoneringen, politieke stromingen, geopolitieke onrust, wat vraagt om aanpassingsvermogen.''

Oud-afdelingshoofd programmamanagement bij DVM:
''De portefeuille is best groot en het effectief gebruik is veel lager.''

''een heel veel groter deel is ouder, heeft energielabel G, F, H, heel hoog en is technisch zwaar gedegradeerd of de plattegrond is niet meer toepasbaar voor wat we nu wensen.''

''De capaciteit van het Rijksvastgoedbedrijf, maar ook de capaciteit aan onze kant om alle projecten enkelvoudig apart te engineeren, is niet meer mogelijk. Dat is het korte antwoord. En hoe komt dat? Omdat onze werklast zo geëxplodeerd is, de opdracht en ook qua budget erbij, dat we eigenlijk naar een andere methode moesten gaan zoeken.''

Oud-afdelingshoofd programmamanagement bij DVM:
''bouwstenen standaardiseren die moet ons helpen om die enorme opdrachten stroom te managen zeg maar want het kan gewoon niet anders. Het kan gewoon niet anders. Hebben de mensen niet voor, en ook stikstof technisch, qua overlast op bestaande locaties, is het bijna niet te managen. Dan duurt die bouwput veel te lang. Je moet ook snel bouwen, zeg maar. Dus tijd is echt een gebied ja''

‘’het opnieuw opschalen ons dermate veel energie en tijd en geld gaat kosten dat je daarmee ook wat tijd in de knijp gaat komen en dreigt te komen’’

‘’want die afmetingen van het materieel wat we krijgen dat laat zich gewoon slecht voorspellen.’’

Oud-afdelingshoofd programmamanagement bij DVM:
‘’Waarmee ik wil zeggen dat de toekomst niet altijd te voorspellen is. Want als we morgen weer iets nieuws moeten bestellen, waarvan we nog niet weten hoe het eruit ziet, dan kan je ook niet op voorhand zeggen aan welke opslagcondities of aan de droge lucht.’’

‘’Nee, we zijn dus verplicht aan onze achterban om de mensen die hard werken voor onze veiligheid een adequate vastgoed aan te bieden. Daar zijn we voor.’’

De meerwaarde van flexibiliteit

Voorzitter programmateam Defensie:
‘’Het kan leiden tot meer structuur en meer water uit de kraan, en in de exploitatiefase de kosten naar beneden te brengen. Minder speciaal dus.’’

‘’De sleutel ligt in het verlagen van de total cost of ownership.’’

‘’De mogelijkheid om te anticiperen op en te voldoen aan toekomstige behoeften van Defensie, zoals de verschuiving naar semi-hybride oorlogsvoering.’’

‘’Een flexibel gebouw, zoals een werkplaats, kan zo abstract gemaakt worden dat het niet meer uitmaakt wat er in zit. Of het nou een tank of een drone is. Dit voorkomt dat het gebouw een heel andere dimensionering van het materiaal nodig heeft.’’

‘’Zet dan maar op een overkill, want je zult er altijd zien dat vooral in de toekomst, en bij Defensie is niets tijdelijk, zelfs de tijdelijke gebouwen zijn voor eeuwig. Ja weet je, die dingen die blijven er zo lang staan, dus dat je, als je nu overdimensioneert, zul je zien dat in de tijd dat gewoon de stad maakt.’’

Oud-afdelingshoofd programmamanagement bij DVM:
‘’niet iedere keer opnieuw die diepte-investering voor iets nieuws te hoeven doen, maar meer moeten insteken op, nou, we verplaatsen de dingen gewoon daarmee kunnen we denk ik een stukje snelheid behalen in de planning.’’

‘’Je kan hem ook gewoon op Marktplaats zetten en zeggen van nou ik heb hier een gebouw en dat gaan we verkopen.’’

‘’Dus eigenlijk kan je heel snel met ‘ik wil zes blokjes van die, twintig van die, en dertig van die en twee van die’, kan je eigenlijk met alle eisen die erbij zijn, heel snel een output-specificatie of een bestek genereren. En met een krappe capaciteit, personeel en zo'n methode, dat is de weg naar succes.’’

Oud-afdelingshoofd programmamanagement bij DVM:

''En bij meer behoeften kan die zo worden verplaatst en dan heb je gewoon heel snel een groter gebouw.''...''dat ik het speelveld aan de voorkant zo ruim mogelijk probeer weg te zetten, om inderdaad die tussentijdse mutaties daarvan bij een groei op een later moment sneller kan faciliteren.''

…''dan kan IFR zeker helpen. Precies wat ik aan het begin zei, dat als een locatie wordt bemenst door een club die kleiner is geworden, maar zo klein dat het niet meer rendeert dat die alleen daar zit, ja die wordt in zijn nek gepakt en die wordt op een andere plaats neergezet. En hoe makkelijk is het dat het vastgoed wat die nu heeft, nou ja, dan mee kan.''

Flexibiliteit op operationeel, tactisch en strategisch niveau

Voorzitter programmateam Defensie:
''Ik denk dat je naar strategisch toe moet, want er wordt nu vooral operationeel en tactisch gekeken.''

''Je zult echt gaan moeten sturen zo meteen welke gebouwen waar je neerzet. Al is het maar ten opzichte van of dat er voldoende inkoop is van energie of voldoende drinkwater. Daar lopen we nu tegenaan.''...''Dus je moet daar veel strategisch mee omgaan dan alleen maar een gebouw bouwen.''

Oud-afdelingshoofd programmamanagement bij DVM:
"Tactisch, ja, je kan uitwisselen over de locaties, als dat echt nodig is.''

Oud-afdelingshoofd programmamanagement bij DVM:
''En operationeel gaat het er gewoon vooral om dat je aan het personeel kan laten zien wat je standaard is. Dus als een militair nou in Ermelo zit of een Oirschot of een Den Helder, de legeringskamer straks als het goed is ongeveer overal gelijk. Dus je weet wat je krijgt, dat kan gunstig zijn.''

Risico's verbonden aan flexibiliteit

Oud-afdelingshoofd programmamanagement bij DVM:
''Gaan we meer groeien dan die 25%? Dan heb ik wel een probleem. Of ik moet kunnen stapelen, dat ik niet BBO heb, Bruto Bebouwde Oppervlak, maar een magazijn of een werkplaats. Dus allemaal op begane grond. Dat kan ik gewoon niet stapelen.''

Oud-afdelingshoofd programmamanagement bij DVM:
''Een nadeel, een onderkend nadeel is als wij tweedehands producten, oude dakpannen of zo, gaan hergebruiken, dan is die aanname van de eerste 10 jaar geen kosten, die gaat scheef. Want, en een ander punt is dat tweedehands producten waar het om certificering gaat, ook nog niet volledig behoorlijk zijn en daarmee wil ik niet zeggen dat we het niet doen maar ik zie het wel als een dilemma.''...''Maar een deel is gewoon niet gecertificeerd. En een van de dingen waarop we aannemers toetsen is of de zaken aan de norm voldoen. Zodat wij kwaliteitsborging hebben. Ik vind het lastig. En primair zijn wij er niet van als opdrachtgever. RVB dient dit voor ons te bewaken. Maar een experiment van een project van een miljard. In mijn geval vind ik het te riskant op dit domein. Dan ga ik liever voor zekerheid en voor garantie dan dat ik experimenteer en daar enorme risico mee loop.''

Oud-afdelingshoofd programmamanagement bij DVM:
''Dat klinkt overigens heel makkelijk maar je snapt natuurlijk dat hij daar nu in woont en uiteindelijk een andere plek moet gaan wonen en op het moment dat je zijn huisvesting oppakt dan heb je een maand of wat die actie van verplaatsen dan heb je even niks dus dus je hebt een soort van schuif voorraad misschien wel nodig om omdat met interim of zo of geeft de naam te managen. Maar het is niet zo dat al het IFR wat je hebt één op één, het gebruik erin al, heel makkelijk te verplaatsen is. Want iedereen snapt dat dat een transitie is van weken, van maanden misschien wel.''

Oud-afdelingshoofd programmamanagement bij DVM:
''In die zin, als het daar onder een bepaalde benchmark komt, dan kan je wel een gebouw oppakken en verplaatsen, maar als het in de harde plek uit elkaar valt en niet meer in elkaar te zetten is, dan…''...''De kans op mutaties in al die categorieën is in de toekomst best wel aannemelijk. En dan is de vraag of zo'n constructie bij zo'n verplichte winkelnering bij zo'n marktpartij die er een maintain heeft of een pps-contractant. Of je dan niet meer dan het dubbele betaalt en eigenlijk de rekening gepresenteerd krijgt.''

''Het risico is wel dat we de kwaliteit die we nodig hebben door al die stapjes onvoldoende wordt geleverd.''...''als we niet oppassen, als we de eisen niet goed meegeven, dat het een lage kwaliteit gaat genereren.''

''en het grootste risico is dan dat dat imago van hier door een klap onderuit gaat en dat zou ik super super super jammer vinden, maar het borgen van kwaliteitseisen is essentieel.''

Expertgroep - behoeftestelling behandelaren:

De betekenis

Senior projectleider vastgoed Marechaussee:
''Hoe kan je het dan flexibel gebruiken en een bepaalde waarde houden zodat je het circulair kan hergebruiken.''

''Ja, want in principe als je het uit elkaar kunt halen, dan kun je het ergens anders, dezelfde configuratie in elkaar zetten.''...''Dus ja, ik zie daar volop flexibiliteit in.''

Beheerder bouwprogramma (DVM):
''Kan je dan zover gaan dat je het ene gebouw wat misschien eerst legering was heel simpel zo flexibel kunt maken dat je het snel kan ombouwen tot een kantoorruimte. Ook daar zullen vergunning technische eisen aan zitten natuurlijk dus ik wil niet zeggen dat het altijd zomaar kan, dat je sneller kunt schakelen met het vastgoed wat je hebt in je bestand.''

''Eenvoudig moet worden kunnen aangepast aan een soort bedrijfsvoering''...''Die bedrijfsvoering kan wisselen. Doordat er een andere eenheid erin gaat of andere activiteiten plaatsvinden. En dan zou je het wat, als het nodig is, eenvoudiger moeten kunnen aanpassen''...''Die moet eigenlijk zo zijn dat het misschien voor meerdere activiteiten bruikbaar is.''

Beheerder bouwprogramma (DVM):
''Niets is zo veranderlijk als Defensie''

''Dat je niet daar weer hele nieuwe behoeftes voor moet opzetten of nieuwe verbouwingen moet doen of wat dan ook.''

Beheerder bouwprogramma (DVM):
''Defensie, het vastgoed is heel traag als ik hier een opdracht geef dan heb ik pas het vastgoed nieuwbouw hebben pas over vier vijf jaar wijze spreken terwijl die oplopende spanning waar we het over hebben die dat kan veel sneller gaan dus je hebt veel eerder heb je misschien meer vastgoed nodig dat zou je misschien kunnen oplossen door een bepaalde flexibele schil te creëren om je defensie vastgoed.''

De noodzaak van flexibiliteit

Senior projectleider vastgoed Marechaussee:
''De stroom in de aankomende jaren. Dat het echt een groot ding gaat worden. Dat het gewoon geen materialen meer zijn.''

''Nieuw materialen. Ja, maar daarom adviseer ik als tweede maatregel een circulariteit index van 80%. Dwing de markt van, ga nou eens niet kijken naar al die nieuwe materialen, maar ik heb als Defensie zo'n enorme voorraad aan gebouwen.''

''In die zin is de uitgave zeer flexibel, maar het gerealiseerde vastgoed daarmee niet.''

Beheerder bouwprogramma (DVM):
''Want nu hebben we te veel vastgoed in verhouding met het budget wat we hebben ik het ook omdraaien we hebben te weinig budget om het vastgoed te onderhouden dus dus je zal slimmer met je omgeving met je met je met je middelen in dit geval je vierkante meters moet omgaan dus dat zou mooi zijn als je die naar beneden kunt brengen.''

''In tijden van leegstand, wat je net aangaf als er minder spanning is en Defensie gaat afbouwen, ja dan komt het financieel vraagstuk weer van ja die gebouwen staan leeg, wat gaan we daarmee doen?''

Beheerder bouwprogramma (DVM):
''Waarom zou je legering, mensen onderkomen brengen, bedjes, waarom zou je dat op een kazerne moeten doen? (...) Je kunt ook buiten je hek werken, kun je eens gaan zoeken naar een legering die je in tijden van hoge nood kunt beleggen. En in tijden van lagere nood heb je dat niet nodig. Dus ga je weer concentreren op je eigen terrein. Dat is ook een stukje flexibiliteit. Dat is een bepaalde schil die je om je defensieorganisatie heen legt. Waarbij je gebruik maakt van externe capaciteiten.''

''Waarom zou ik hier moeten werken, terwijl ik ook buiten het hekwerk kan werken. Dat gebeurt ook, want ik ben ook thuis werken dus dat dat is een bepaalde flexibel schil waarbij gebruik maakt van van ja niet het defensie vastgoed maar ander vastgoed dus dat zou je ook door kunnen voeren als zij een stukje flexibiliteit.''

Senior projectleider vastgoed Marechaussee:

''Het is gewoon het spanningsveld waar je dan in zit. Je wil wel maar je wordt tegengehouden. Je krijgt meer mensen en dus wil je bouwen maar je mag je weer niet bouwen. Dus dat is een ontzettend tegenstrijdig iets''

''Het ouderwets, stenen stapelen met cementen tussen, een steigertje bouwen, plankje erop schuiven, volgende dag weer stenen stapelen en dan komt de metselaar en die doet weer een meter metselen.''…''die afvalstroom ook op de traditionele bouwplaats is natuurlijk gigantisch, daar betaal je voor. En door het industrieel bouwen zeg je dus tegen de producent van jouw elementen, als je het niet zelf maakt, ik wil alleen maar elementen hebben van 1 meter 20. En die knutsel ik in elkaar. Er komt in mijn fabriek geen zaag meer aan te pas. Het enige wat ik nog doe is assembleren.''

De meerwaarde van flexibiliteit

Senior projectleider vastgoed Marechaussee:
''Dan kan je daar meerdere waarden uithalen naar een aantal, wat uiteindelijk ook wel financieel terug te leiden is.''

''Ze kunnen sneller produceren, meer produceren, hebben geen vorstverlet enzovoort.''

Senior projectleider vastgoed Marechaussee:
''Want die ziet dat er potentieel bouwmateriaal in zit. En dat doet hij niet voor zijn huidige regeerperiode, zolang hij CEO is of wat dan ook, maar je doet het voor de continuïteit van het bedrijf.''...''En de commerciële markt die kijkt ook echt wel naar euro's, maar die kijkt ook veel meer naar continuïteit. Je ziet daar potentie in. En eigenlijk zou Defensie dat ook eens moeten gaan zien. Wat je nu bouwt, is je markt voor de toekomst.''...''Eén, dat het goedkoper is. Ga werken met je materialen die je al in bezit hebt. Dan wel waar een marktpartij geld voor overheeft om het te krijgen. Je winst gaat zitten in industrieel bouwen. Omdat je sneller en meer kunt bouwen in dezelfde periode. En waarschijnlijk voor minder geld.''

''Maar je weet wel, het zal altijd geld opleveren. (...) circulair en biobased heb gebouwd, behoudt dat altijd iets van economische waarde.''

Beheerder bouwprogramma (DVM):
''Door de fabriek of wat dan ook grote hoeveelheden te laten maken en op afroep ergens het gebouw neer te zetten.''

''Het gaat met name om de snelheid nu, denk ik. Sneller moeten we nu wat op de locatie hebben, de snelle nieuwbouw kunnen plegen, sneller kunnen inspringen op de behoeften die er is.''

Beheerder bouwprogramma (DVM):
''je zou dat dit concept natuurlijk best kunnen gebruiken door continu een gebouw leeg te halen daarin te zetten een nieuw gebouw maken vol gebouw en dit is echt een soort wissel locatie dat kan je op de kazerne beperken.''

Beheerder bouwprogramma (DVM):

''Tegenwoordig is er zoveel mogelijk denk ik in de IFR. Dat je bij wijze van spreken aan de buitenkant niet eens meer ziet dat het, ik noem maar even containerachtige aspecten zijn die je stapelt. Dat hoeft volgens mij al niet eens meer. Je kunt hele mooie schillen omheen maken en dat allemaal in de fabriek allemaal netjes al voorbewerkt kan worden.''

Beheerder bouwprogramma (DVM):
''Op elk niveau heb je dat wel, bepaalde flexibiliteit nodig''

''Bij ons op dit niveau want je dat het uitvoeren niveau is ja enigszins wel maar dan ook zou het vooral gaan om de flexibiliteit om een bepaalde gebouw zodanig te bouwen dat het flexibel is.''...''Terwijl op het theorie niveau is het een heel ander soort flexibiliteit denk ik die je moet hebben.''

''Strategisch. Dat zit meer op een wat hoger abstracte niveau denk ik. Dan heeft het meer te maken met strategische ruimte die de flexibiliteit die je wil hebben van je kazerne. Dan moet je bepaalde reserveruimte hebben om snel te kunnen schakelen om de extra eenheden of extra activiteiten te kunnen ontplooien. Dat ligt een beetje voor mij op een wat hoger niveau.''

Senior projectleider vastgoed Marechaussee:
''Ik geloof nooit dat ze in de toekomst gebouwen gaan verplaatsen. Ik geloof het nooit. Want we hebben geen grond. Ik denk dat grond de sleutel is.''...''Grond wordt sleutel wordt qua strategische vastgoed flexibiliteit denk ik nou vanuitgaande dus dat het eigenlijk altijd blijft groeien in die zin ja en in de de kernen van de stad worden wel vernieuwd, maar de vraag is, met flexibele bouw, ga je ook het karkas vervangen? Ga je de inbouw vervangen? De raampartijen vervangen? De buitengevel vervangen?''

Senior projectleider vastgoed Marechaussee:
''Hoe kan je het dan flexibel gebruiken en een bepaalde waarde houden zodat je het circulair kan hergebruiken. Dus dat betekent dat als je de R-ladder zou hebben, dat je eigenlijk ook gaat monitoren om zo hoog mogelijk op die R-ladder de materialen te houden.''

''Dan geef ik dus aan Defensie het advies, ga naar een losmaakbaarheidsindex van 80%. Want daarmee kun je het altijd hergebruiken.''

Senior projectleider vastgoed Marechaussee:
''flexibiliteit in het bepalen eigenlijk van je elementen of je modules.''

''En als je op een gegeven moment een legeringsgebouw nodig hebt voor 200 man, dan ga je die bouwen en de wereld verandert. We gaan de krijgsmacht uitbreiden en we moeten het gebouw uitbreiden van 200 naar 300 kamers. Dan kun je dat op een aantal manieren doen. Aanbouwen, opbouwen, uitbouwen, hoe je het maar noemt.''...''Ja, dan hebben we met name over het tactische niveau van flexibiliteit inzetten.''

Senior projectleider vastgoed Marechaussee:
''In het gebouw, muurtje erbij, muurtje eraf. Deurtje links draaiend, rechts draaiend. Ja, dat doe ik.''...''En daar ga ik mijn winst in halen. Het optimale van het assembleren.''

Senior projectleider vastgoed Marechaussee:
''Toeleveranciers van cabines, van de chassis, van de banden, van weet ik veel wat allemaal. Allemaal just in time. En dat kun je natuurlijk ook met het bouwproces doen.''

''De 80-80-80 regel. Dus het gaat met name om de losmaakbaarheid. Circulariteit. En herbruikbaarheidsindex.''

''Wat ze nu doen, de fabrikant maakt flexwoningen in de fabriek. Die hebben als grondoppervlak, ik meen 4 bij 5 meter, maken dan daar drie verdiepingen en zetten de ruggen tegen elkaar. En zo heb je 60 vierkante meter woonoppervlak. Wel over drie vloeren. En die gooi je op de rug van het gebouwtje op een dieplader. En die takelt die tegen elkaar aan op de bouwplaats. En klaar, hier is de sleutel.''

Risico's verbonden aan flexibiliteit

Senior projectleider vastgoed Marechaussee:
''zeggen dat ik heb het al getest en geprobeerd en het valt vies tegen. Hij maakt er iets anders van dan dat jij in gedachte had.''...''Ja, er zijn ongetwijfeld al goede programma's maar het is natuurlijk een beetje met data en dataveiligheid dat je het niet alles evenveel te vertrouwen is. Daar zijn we wel voorzichtig mee.''

Senior projectleider vastgoed Marechaussee:
''Die kijken eigenlijk alleen naar dit jaar. Wat heb ik aan geld in dit jaar staan en wat kan ik ermee doen? En circulariteit, dat ken ik niet. Dat zal ongetwijfeld geld kosten. Dat doen we niet.''...''Het is allemaal korte termijn gedachten.

''Niemand kan daar antwoord op geven (over de vraag hoe meet je circulariteit). En dat is niet alleen op vastgoedgebied. De hele organisatie wil 50% circulair zijn. In gewicht, in euro's, in weet ik veel wat.''...''Dat staat in een beleidsdocument. Het hoofdministerie van Defensie heeft het Rijk ook gezegd. Wij willen in 2030 50% circulair zijn. Punt. Dus dat beleidsdocument is een wasse neus.''...''En dan kunnen ze zeggen, als je het antwoord niet weet, dan ga ik achterover leunen. Maar als je achterover leunt, dan ga je achteruit.''

Senior projectleider vastgoed Marechaussee:
''Het voldoet niet aan onze normen. Die afvragen of de normen wel goed zijn. (...) Nee, de norm is 18 vierkante meter. Dan wordt die niet 90% van het prijs, maar 120% van het prijs. Ja, dat kan niet, want ik heb maar 100%. Die 100 euro die je mag. Ja, maar doordat je vasthoudt aan die norm van 18 wordt die 120.''

''Bureaucratie. We worden helemaal kapot geregeerd door bureaucratie. En daar zit geen flexibiliteit in. In het gebouw wel. Maar in de bureaucratie mist het gewoon flexibiliteit.''...''Nu krijg je op een gegeven moment alleen maar steeds meer bureaucratie. En dat beperkt je flexibiliteit. Je aanpassingsvermogen.''...''De bureaucratie is al een drama.''

Senior projectleider vastgoed Marechaussee:
''Angstcultuur denk ik. We krijgen alleen maar eenheidsworsten. Er zit geen flexibiliteit meer in gebouwen.''...''En wat als een project duurder uitvalt, dan moeten we weer terug naar

DVM, aanvullen met fondsaanvraag. (...) Geld is het probleem niet. Maar gewoon de regeltjes, het budget en dergelijke.''

Beheerder bouwprogramma (DVM):
''Op dit moment is dan ecologisch is dan wel de bottleneck. Dat kan ik je wel vertellen. (...) Meerdere projecten komen nu stil te liggen na een van de laatste uitspraak van de Raad van State? Terwijl je toch, ja, meneer Poetin die wacht niet bij wijze van spreken.''...'''Dat is wel een spanningsgebied inderdaad''...''Het is gewoon het spanningsveld waar je dan in zit. Je wil wel maar je wordt tegengehouden. Je krijgt meer mensen en dus wil je bouwen maar je mag weer niet bouwen. Dus dat is een ontzettend tegenstrijdig iets.''

Focus Group

Documenten

1. De Definitie van flexibiliteit

Uit de uiteenzetting van de benadering van flexibiliteit in een vastgoedportfolio wordt de volgende definitie gegeven: *het vermogen van vastgoed om zich, daar waar nodig, op tijd aan te passen aan nieuwe, andere of veranderende omstandigheden / eisen, met het oog op waardebehoud of creatie. De aanleiding tot nieuwe, andere of veranderende omstandigheden / eisen kunnen gevonden worden in veranderende bedrijfsvoering door demografische, economische, ecologische, politieke, en/of technologische trends.*

2. De opgave

Defensie staat op een keerpunt in haar vastgoedstrategie. Het huidige vastgoedportfolio is versnipperd, verouderd en onvoldoende wendbaar om mee te bewegen met de dynamiek van de hedendaagse en toekomstige veiligheidssituatie. Gebouwen en infrastructuur sluiten vaak niet meer aan op de behoeften van de organisatie, noch voldoen ze aan de eisen die worden gesteld aan duurzaamheid, technologische integratie of personele aantrekkelijkheid. De vertragingen in vergunningstrajecten, de impact van stikstof- en milieuwetgeving, en de oplopende onderhoudskosten illustreren een vastgoedbeleid dat niet langer toekomstbestendig is. Tegelijkertijd worden de eisen aan Defensie juist groter: er moet sneller worden opgeschaald, er moet samengewerkt worden met internationale partners, en de werving en binding van gekwalificeerd personeel is urgenter dan ooit.

In de probability-impactmatrix wordt zichtbaar gemaakt welke trends en ontwikkelingen niet alleen waarschijnlijk zijn, maar ook een substantiële impact zullen hebben op de vastgoedopgave van Defensie. Van deze trends springt er een aantal duidelijk uit op zowel impact als waarschijnlijkheid: de groeiende ruimteclaim binnen Nederland, de noodzaak tot circulair bouwen, de schaarste aan materialen en mensen, en de veranderende veiligheidssituatie in Europa. In combinatie zetten deze ontwikkelingen druk op het bestaande vastgoedportfolio van Defensie.

De opgave die daaruit voortvloeit is tweeledig. Enerzijds is er een functionele behoefte aan gebouwen die eenvoudig kunnen worden aangepast, verplaatst of getransformeerd in gebruik.

Anderzijds ligt er een structurele uitdaging: het ontwikkelen van een ontwerp- en besluitvormingspraktijk die dit soort flexibiliteit vanaf de tekentafel mogelijk maakt. Hier komt de organisatie van DfA/DfD in beeld.

3. De definitie van flexibiliteit in een vastgoedportfolio

Flexibiliteit in een vastgoedportfolio verwijst naar het vermogen van vastgoed om zich aan te passen aan veranderende organisatorische behoeften, gebruiksfuncties en financiële randvoorwaarden. Dit omvat drie hoofdtypen flexibiliteit:

- Fysieke flexibiliteit, zoals de mogelijkheid om gebouwen remontabel, uitbreidbaar of herindeelbaar te maken (via Design for Disassembly (DfD) en Design for Adaptation (DfA));
- Functionele flexibiliteit, waarbij ruimten multifunctioneel inzetbaar zijn en eenvoudig kunnen worden aangepast aan veranderende eisen;
- Financiële flexibiliteit, zoals het kunnen sturen op Total Cost of Ownership en restwaarde, passend bij strategische vastgoedbeslissingen.

Daarbij speelt organisatorische flexibiliteit een sleutelrol: vastgoed moet een wendbare bedrijfsvoering kunnen ondersteunen, vooral in dynamische omgevingen zoals bij Defensie. Ook procesflexibiliteit is cruciaal, waarbij standaardisatie en aanpasbare processen helpen om sneller en efficiënter te reageren op veranderingen tijdens ontwikkeling en beheer. Flexibiliteit is daarmee geen vast kenmerk, maar een strategisch middel dat via integraal ontwerp, beheer en besluitvorming wordt gerealiseerd.

Type flexibiliteit	*Kenmerken*	*Doel*	*Voorbeeld toepassingen*
Fysieke flexibiliteit	Aanpasbaarheid van gebouwstructuur; remontabel, modulair, uitbreidbaar	Bouwen dat inspeelt op wijzigende ruimtebehoeften	IFR-bouw (Industrieel, Flexibel, Remontabel), uitbreidbare units
Functionele flexibiliteit	Meervoudig gebruik van ruimtes zonder ingrijpende aanpassingen	Ruimtes flexibel inzetten bij veranderende functies	Wanden verplaatsen zonder installatiewijziging, 6S-model grens
Financiële flexibiliteit	Sturen op kosten over de levensduur; TCO-berekeningen; restwaardesturing	Inzicht in lange termijn investeringen en scenario's	TCO met R-ladder benchmarking, modulair investeren bij uitbreiding

Procesflexibiliteit	Vermogen om het ontwikkelproces aan te passen aan veranderende eisen	Efficiënt reageren op veranderingen tijdens initiatief of realisatie	Gestandaardiseerde typologieën, aanpasbare aanbestedingen

Tabel 1: Algemene benaderingen van flexibiliteit voor vastgoed

Schaalniveau	Productflexibiliteit	Procesflexibiliteit	Organisatieflexibiliteit
Gebouw	Remontabel, modulair, multifunctioneel (DfD & DfA); flexibel in gebruik	Gestandaardiseerde typologieën, aanpasbare contracten; efficiënte TCO-sturing	Grip op gebruik en beheer per gebouw; data-inzicht in benutting
Object (Kazerne)	Flexibele clustering van gebouwen; onderlinge uitwisselbaarheid van functies	Flexibele vergunningsstructuur; inzet van tijdelijke voorzieningen; schaalbare inzet	Sturing op objectniveau mogelijk door lokale data; efficiënte capaciteitsplanning
Portfolio	Strategisch gespreide en uitbreidbare vastgoedposities; waardebehoud op lange termijn	Flexibele raamcontracten en aanbestedingen; strategische schuifpuzzel mogelijk	Centrale sturing met decentrale uitvoering; continue afstemming op beleid en operatie via data

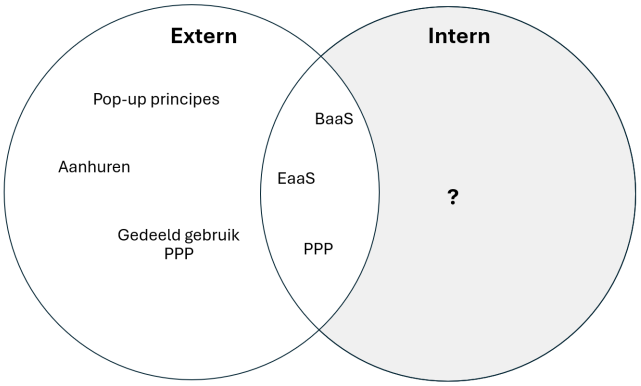
Tabel 2: Algemene benaderingen van flexibiliteit in een portfolio

Toelichting:

- Productflexibiliteit groeit van gebouwspecifieke aanpasbaarheid naar strategisch inzetbare locaties en waardebehoud over het gehele portfolio.
- Procesflexibiliteit verschuift van projectgebonden efficiëntie naar portfolio-gedreven dynamiek, met ruimte voor groei/krimp via vergunnings- en contractstrategieën.
- Organisatieflexibiliteit vereist schaalbaar management, waarbij portfolio sturing afhankelijk is van de mate van grip en inzicht op gebouw- en objectniveau.

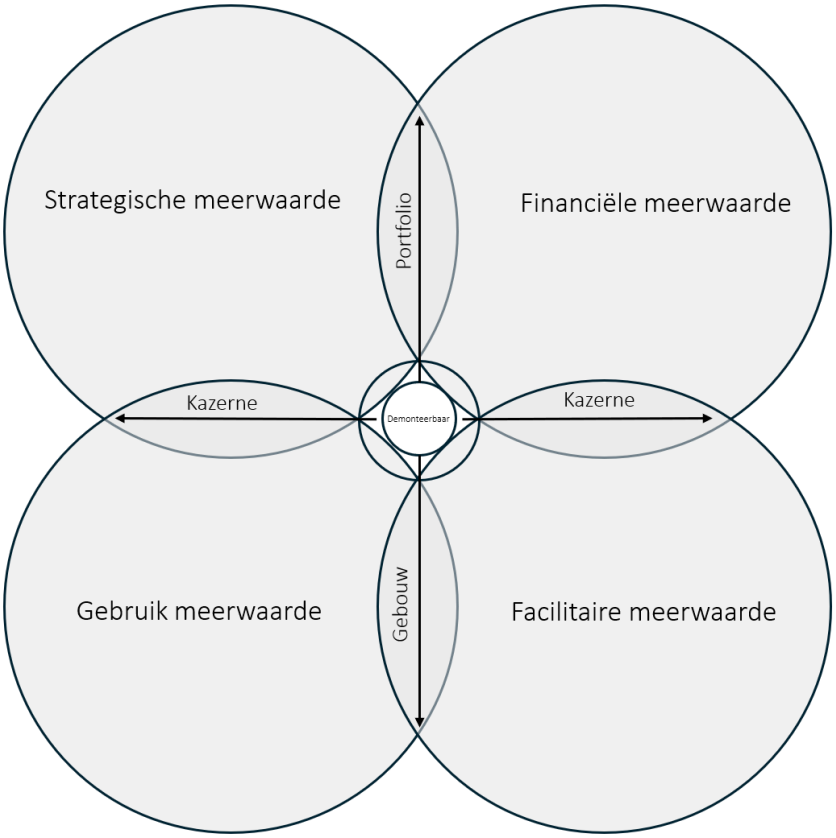
4. Raamwerk flexibel vastgoed portfolio

Flexibiliteit in vastgoed kan ook extern worden ingevuld, bijvoorbeeld via outsourcingprincipes zoals *Building as a Service* (BaaS), *Energy as a Service* (EaaS) of het huren van externe locaties. Het model in dit hoofdstuk richt zich echter uitsluitend op interne vastgoedflexibiliteit, passend bij de strategische keuze van Defensie om vastgoed in eigen bezit en beheer te houden (figuur 1).



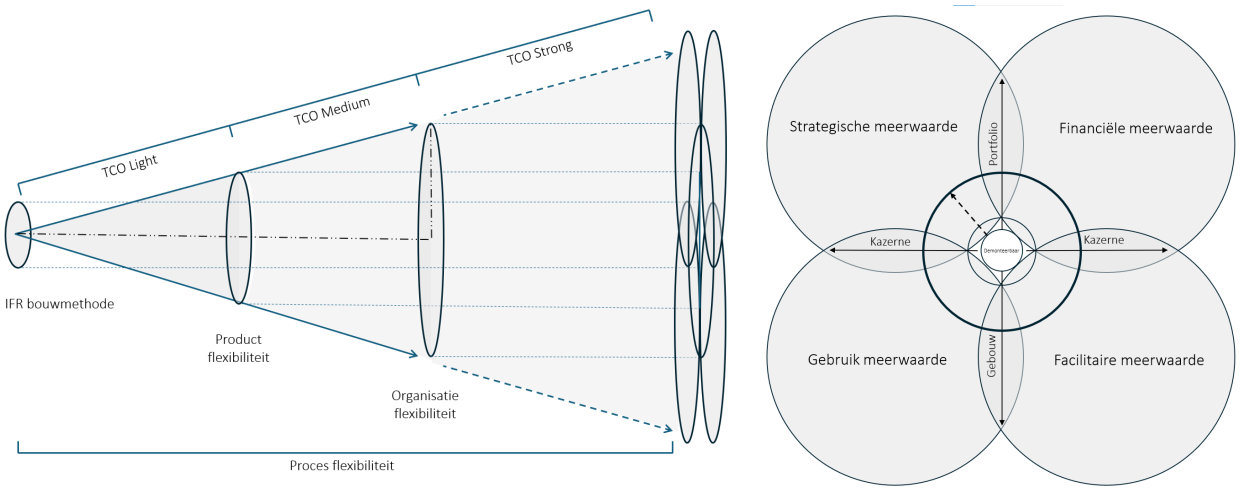
Figuur 1: Invulling flexibele principes extern/intern in een organisatie

In de meest eenvoudige vorm impliceert bouwen volgens de IFR-methode (DfD/DfA) dat een gebouw demontabel is (de centrale cirkel in figuur 2). Echter, binnen de huidige cultuur van Defensie, waarin gebouwen tot ver na hun technische levensduur worden gebruikt (zonder verzekering of afschrijving), betekent deze demontabiliteit nog weinig. Pas als er daadwerkelijk gestuurd wordt op het moment en de wijze van demontage en hergebruik (bijvoorbeeld verkoop), ontstaat er een vorm van meerwaarde. Zonder die aansturing blijft het object binnen de grenzen van de tweede ring van figuur 2. Ook flexibiliteitsmaatregelen in het product, zoals herontwerp, uitbreiding, krimp of verplaatsing, kunnen deze grens niet passeren zonder organisatorische ondersteuning, en komen daarmee niet in de sferen van gebouw, kazerne of portfolio flexibiliteit.



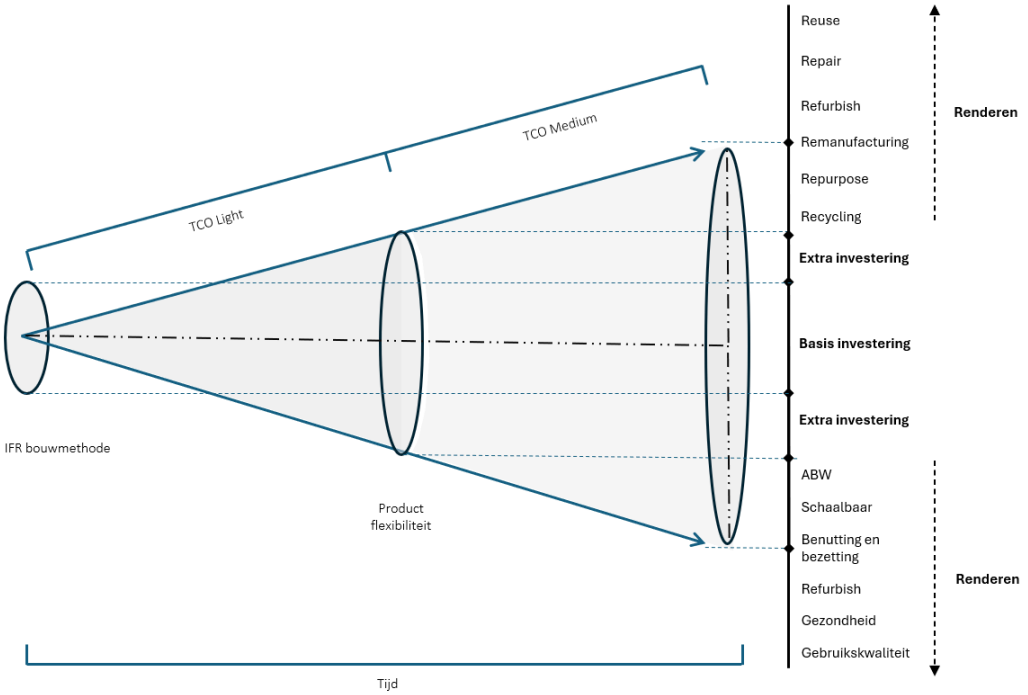
Figuur 2: DfD/DfA als centraal uitgangspunt portfolio flexibiliteit

In onderstaande figuur (3) wordt ook de mate van Total Cost of Ownership (TCO) weergegeven. TCO is een benadering die alle kosten inzichtelijk maakt die gepaard gaan met het realiseren en gebruiken van vastgoed. In plaats van zich uitsluitend te richten op de initiële investering, neemt TCO ook bijkomende kosten in beschouwing, zoals onderhoud, gebruik, risico's en afschrijving. Deze bredere kijk biedt een vollediger beeld van de werkelijke financiële impact en helpt bij het nemen van beter onderbouwde investeringsbeslissingen. Daarbij kunnen ook positieve elementen worden meegenomen, zoals de restwaarde van het vastgoed bij verkoop. Deze benadering vormt de meest basale en directe vorm van kostenbepaling. De afbeelding toont dus de dimensie van proces flexibiliteit als factor van TCO berekeningen.



Figuur 3: TCO als katalysator voor flexibiliteit

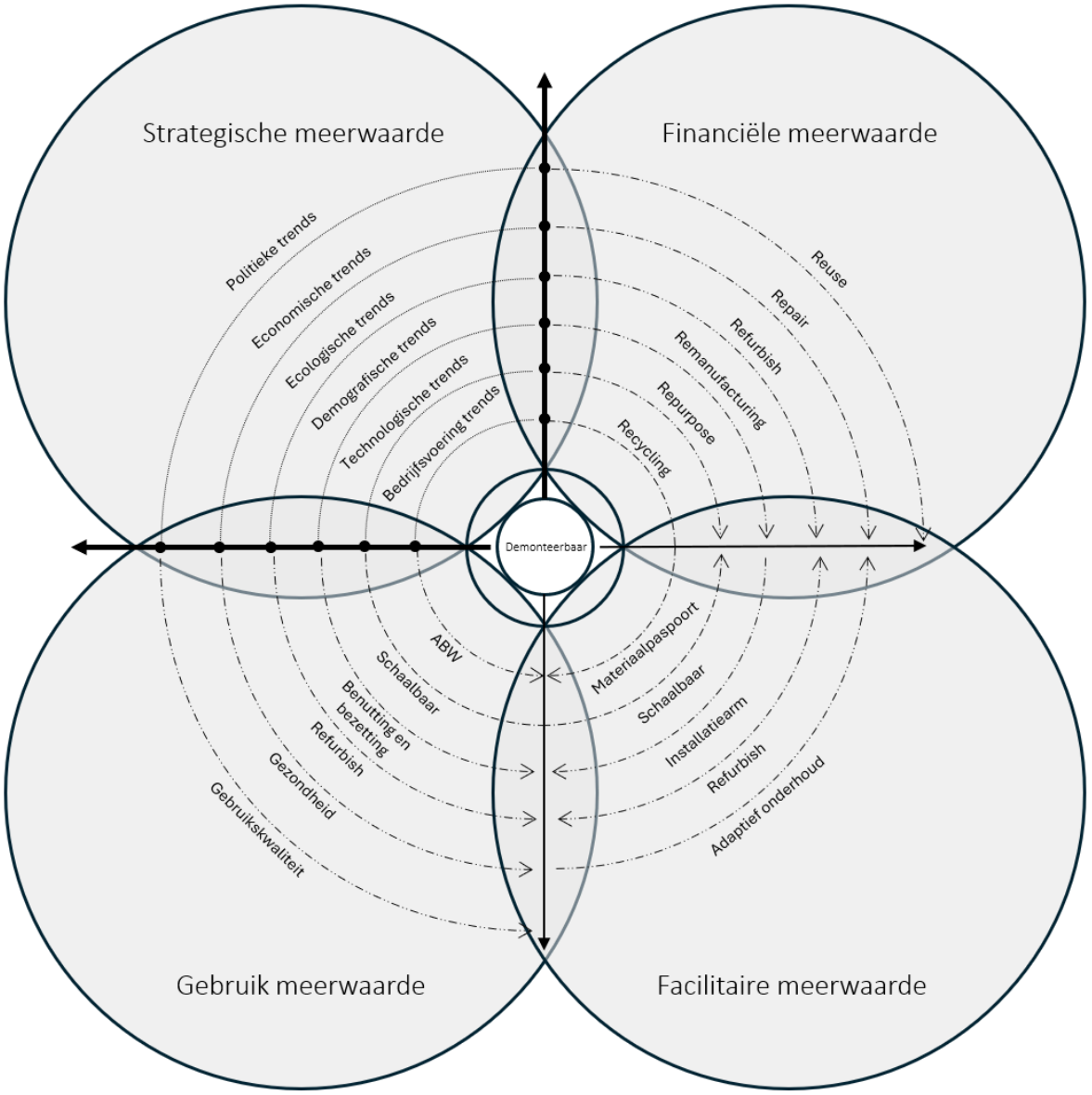
Een verdiepende aanvulling op de TCO-berekening ontstaat wanneer flexibel vermogen wordt meegenomen, zoals gedefinieerd in de vijf flexibiliteitsklassen van Geraedts et al. (2014). Het inbouwen van flexibiliteit leidt vaak tot hogere initiële investeringen, maar deze extra kosten kunnen gerechtvaardigd worden wanneer ze toekomstige sloop- en nieuwbouwprojecten helpen voorkomen. De vraag is echter of deze investering rendabel is in een gestandaardiseerd vastgoedproces, waarin slechts een klein deel van de gebouwen daadwerkelijk gebruikmaakt van het ingebouwde flexibele vermogen, bijvoorbeeld (ter illustratie) slechts één op de 20, 30 of 40 gebouwen. In het model benoemt als 'TCO medium': complexer, met bredere organisatorische afwegingen.



Figuur 4: Verhouding investeren-renderen in de TCO berekening

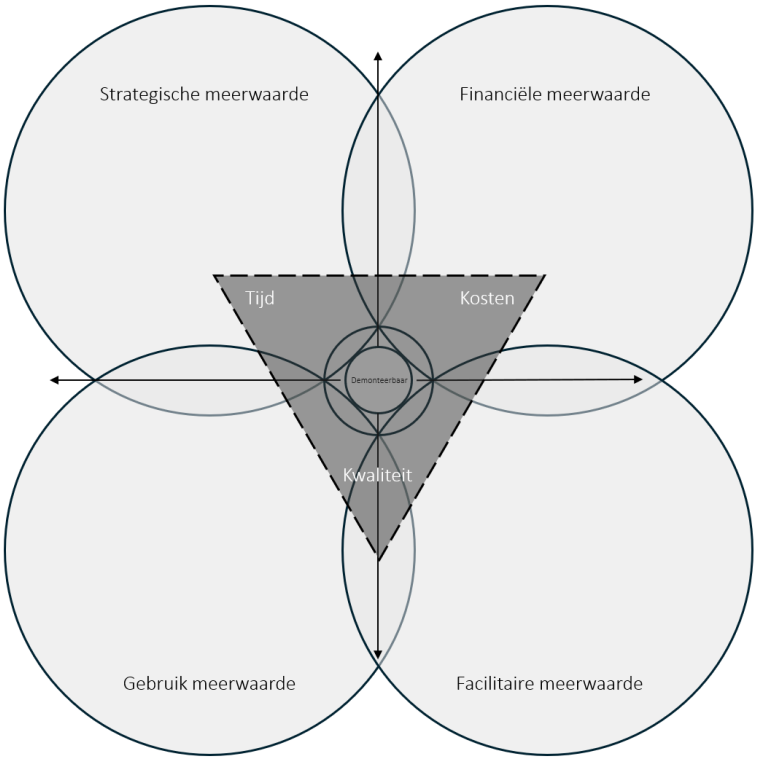
Een derde, diepgaandere benadering is zichtbaar in de afbeelding als 'TCO strong'. Hierbij wordt ook de flexibiliteit van de organisatie zelf meegenomen, het ‘onder controle’ hebben van de organisatie mbt vastgoed, in de kostenafweging. Organisatieflexibiliteit stelt een organisatie beter in staat om effectief gebruik te maken van het flexibel vermogen in haar vastgoed. Dit vergt weliswaar extra inspanningen en investeringen, maar levert daardoor juist substantiële meerwaarde op, zowel op gebouwniveau als op portfolioniveau (zie figuur 3 & 4). Waar zonder/reële organisatieflexibiliteit het flexibele vermogen wellicht op slechts 1 op de 40 gebouwen wordt benut, kan dit met goede organisatorische sturing oplopen tot 1 op de 20 of misschien zelfs 1 op de 10. Dit toont hoe waardecreatie direct samenhangt met investeringen in zowel vastgoed als organisatiecapaciteit.

Het vertrekpunt in deze benadering is het vastgoedportfolio en de strategische en financiële meerwaarde die ermee samenhangt. De onderliggende veronderstelling is dat de R-ladder een effectief raamwerk biedt in deze context om financiële meerwaarde te vergroten, juist omdat deze direct gekoppeld is aan het versterken van de strategische meerwaarde. De mogelijkheid om flexibel te reageren op trends, die in steeds grotere context genomen kunnen worden, creëert waarde op beide vlakken (Figuur 5).



Figuur 5: Waardecreatie door organisatie

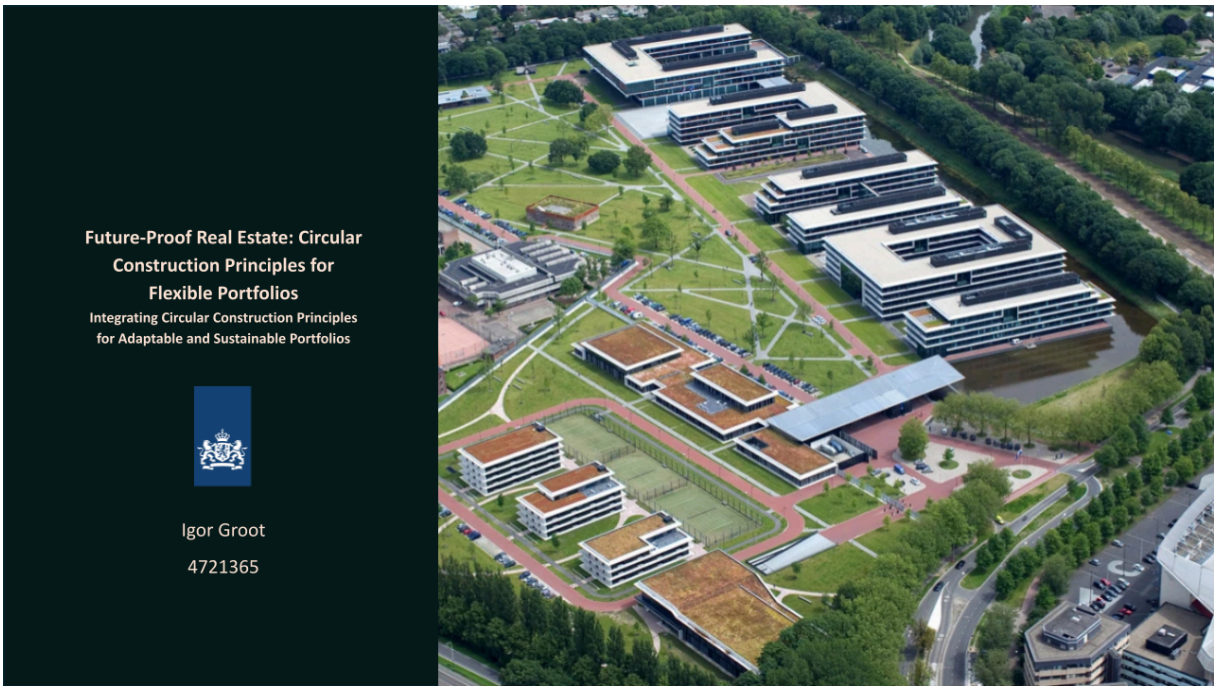
Binnen een organisatie zoals Defensie voeren tijd en kosten de boventoon in investeringsafwegingen. Dit wordt ingegeven door de noodzaak om binnen beperkte tijd en met minimale financiële middelen te reageren op veranderende trends. Kwaliteit, gedefinieerd in termen van onderhoud, veiligheid en gezondheid, krijgt binnen deze afweging een minder prominente rol (Figuur 6). Dit kan echter nieuwe problemen veroorzaken, zoals het verlies van aantrekkelijkheid als werkomgeving, waardoor jong en nieuw personeel wegblijft.



Figuur 6: 'Iron triangle' in relatie tot waardecreatie

Alle aspecten binnen deze dynamiek zijn nauw met elkaar verbonden: problemen op het ene vlak hebben onvermijdelijk gevolgen voor andere gebieden. Hierin speelt organisatieflexibiliteit een cruciale rol. Hoe groter de mate van controle over de eigen organisatie, hoe beter waarde kan worden behouden of gecreëerd.

Presentatie



Planning

1230u	30min	presentatie van bevindingen
1245u	30min	discussie mbt presentatie
1315u	30min	koffiepauze
1330u	15min	toelichting casussen in syndicaten
1345u	30min	casus behandelen in syndicaten
1415u	60min	presentatie casussen + discussie
1515u	30min	afronding
1545u	15min	einde - uitloop tot 1600u

Doel & Verwachtingen

Deel 1: Validatie van het framework

a. Samenhang
b. Definities
c. Verbindingen

Deel 2: Antwoord vinden op de hypothese

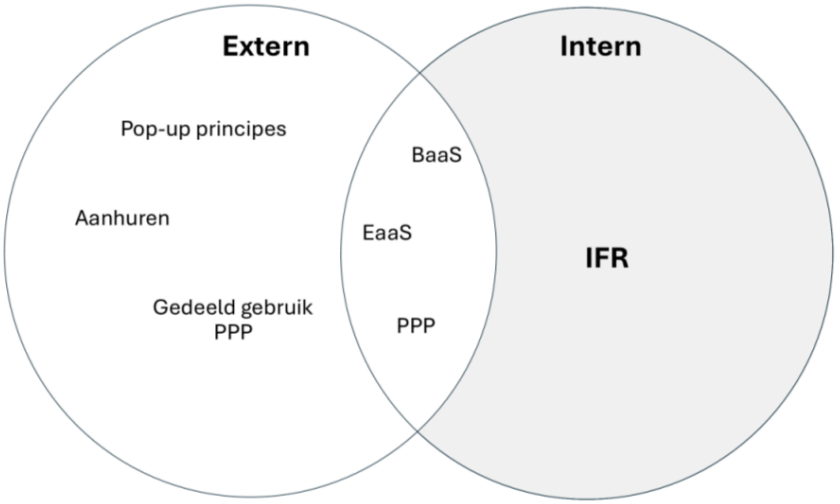
Hypothese:
IFR (met DfA en DfD karakteristieken) vastgoed is in staat om zich aan te passen aan veranderende bedrijfsvoering. I.p.v. dat een organisatie zich moet aanpassen aan de beperkingen van het beschikbare vastgoed.

Terminologie

IFR = Industrieel Flexibel Remontabel

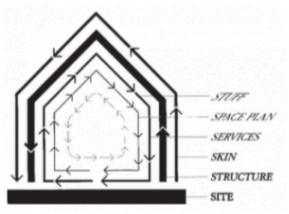
DfA = Design for Adaptation

DfD = Design for Disassembly



DfA/DfD

- 3s vs 3s - DfA/DfD
- In de volle breedte
- Product flexibiliteit



DfA/DfD-principes:	*Stuff/Space plan/Services*	*Skin/Structure/Site*
Reallocate	De mate waarin een gebouw opnieuw ingedeeld of herontworpen kan worden om aan nieuwe gebruikerseisen te voldoen.	
Grain size	De mate waarin het aantal gebruikers van een gebouw kan toenemen of afnemen.	
Facilities	De mate waarin de faciliteiten kunnen veranderen binnen en/of buiten het gebouw.	
Expansion	De mogelijkheid om een gebouw uit te breiden om tegemoet te komen aan veranderende vraag naar ruimte.	
Rejection	De mate waarin een gebouw afgestoten kan worden wanneer deze niet langer rendabel is binnen het portfolio.	
Transfer	De mate waarin een gebouw kan worden verplaatst naar een andere locatie.	

Flexibiliteit

Het vermogen van vastgoed om zich, daar waar nodig, op tijd aan te passen aan nieuwe, andere of veranderende omstandigheden / eisen, met het oog op waardebehoud of creatie. De aanleiding tot nieuwe, andere of veranderende omstandigheden / eisen kunnen gevonden worden in veranderende bedrijfsvoering door demografische, economische, ecologische, politieke, en/of technologische trends.

Het **vermogen** van vastgoed om zich op **tijd** aan te passen aan nieuwe **bedrijfsvoering**, met het oog op **waardebehoud** of **creatie**. Wordt veroorzaakt door demografische, economische, ecologische, politieke, en/of technologische **trends**.

Het ‘vermogen’

Voor enkele gebouwen (zowel vraag als aanbod gestuurd)
- Product
- Proces
- Organisatie

Voor een portfolio (aanbod gestuurd)
- Fysiek
- Financieel
- Functioneel

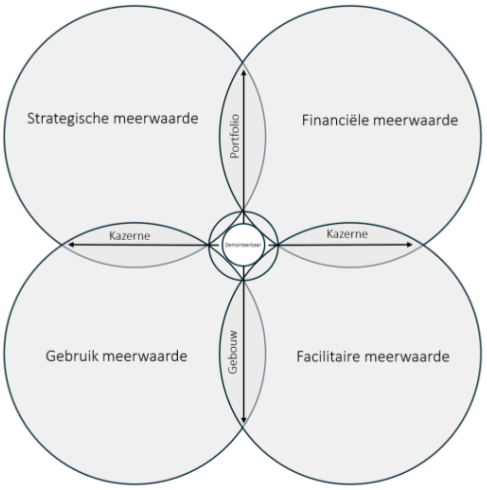
Het ‘vermogen’

Flexibel	Fysiek	Financieel	Functioneel
Product	*Het middel*		
Proces			
Organisatie			*Het doel*

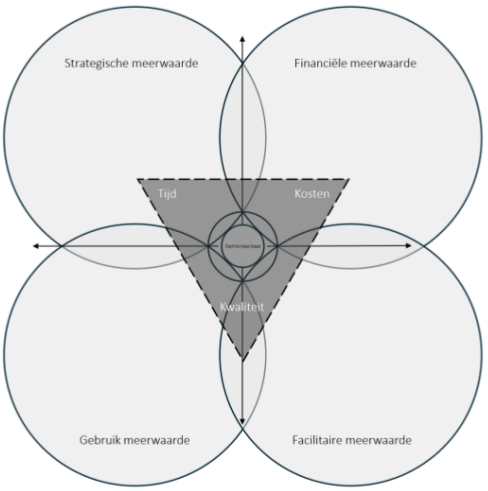
Het ‘vermogen’

Flexibel	Fysiek	Financieel	Functioneel
Product	*IFR gebouw (DfD & DfA) - 3S (Structure, Skin, Site)*	TCO (Light)	IFR gebouw (DfD & DfA) - 3S (Stuff, Space Plan, Services)
Proces	Standaardisatie	x	Benutting en bezetting
Organisatie	Onder controle hebben van adaptatie en afstoten	TCO (Strong)	*Wendbare bedrijfsvoering en strategische herstructurering.*

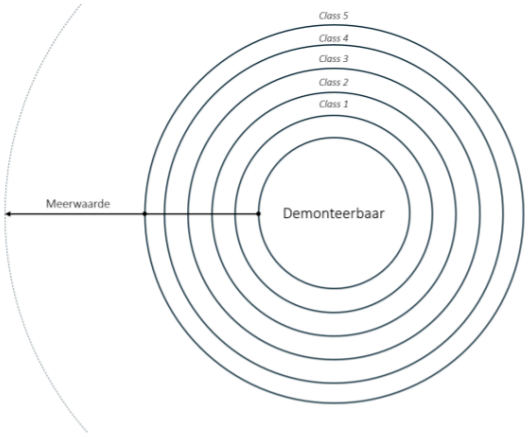
Waardebehoud of creatie



Waardebehoud of creatie



Product flexibiliteit

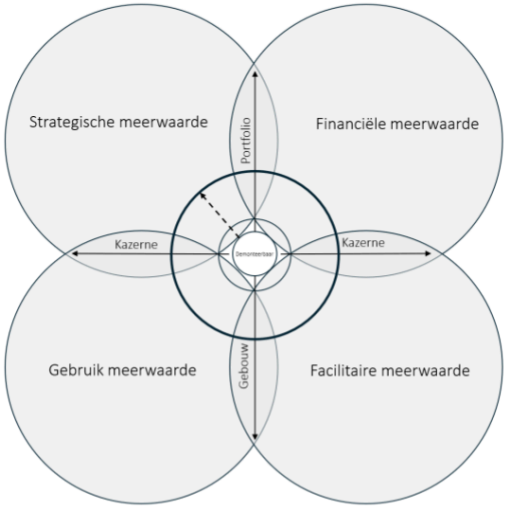


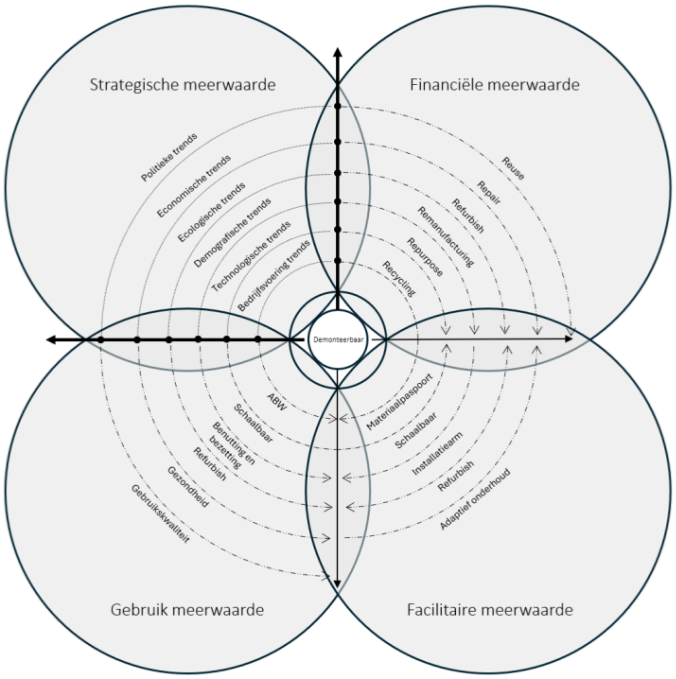
Assessment Form 32 Specifically Applicable Flexibility Indicators

LAYER	SUB-LAYER	Flexibility Performance Indicator	Weighting	Assessment	Score
1. SITE		1. Surplus of site space	4	1	1
		2. Multifunctional site/location	3	1	3
2. STRUCTURE	Measurements	3. Available floor space of building	4	3	12
		4. Size of floor buildings	3	4	12
		5. Measurement system; modular coordination	3	1	3
		6. Horizontal zone division/layout	1	3	3
		7. Presence of stairs/elevators	2	2	4
		8. Extension/reuse of stairs/elevators	1	4	4
	Construction	9. Surplus of load bearing capacity	2	1	2
		10. Shape of columns	1	3	3
		11. Positioning of facilities zones and shafts	3	2	6
		12. Fire resistance main bearing construction	3	4	12
		13. Extendible building/units horizontal	2	1	2
		14. Extendible building/units vertical	4	3	12
		15. Rejectable part of building/unit horizontal	2	2	4
		16. Insulation between stories and units	2	4	8
3. SKIN	Facade	17. Dismountable facade	1	1	1
		18. Location/shape daylight facilities	2	3	6
		19. Insulation of facade	1	2	2
4. FACILITIES	Measure/Control	20. Measure & control techniques	4	4	16
	Dimensions	21. Surplus capacity of facilities	4	1	4
	Distribution	22. Distribution facilities	4	3	12
		23. Location sources facilities (heating, cooling)	3	2	6
		24. Disconnection of facility components	3	4	12
		25. Accessibility of facility components	3	1	3
		26. Independence of user units	1	3	3
5. SPACE PLAN	Functional	27. Multifunctional building	2	2	4
	Technical	28. Disconnectible, removable, relocatable units	1	4	4
		29. Disconnectible, removable, relocatable walls	4	1	4
		30. Disconnectible connection detail inner walls	4	3	12
		31. Possibility of suspended ceilings	2	2	4
		32. Possibility of raised floors	2	1	2
		Example of total Flexibility Score:			186
		Flexibility Class:			2

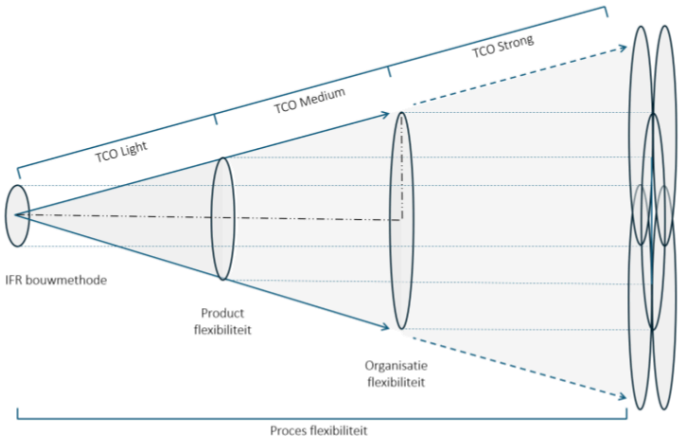
CLASS TABLE FLEXIBILITY SCORES	Score range
Class 1: Not flexible at all	32 - 128
Class 2: Hardly flexible	129 - 225
Class 3: Limited flexible	226 - 322
Class 4: Very flexible	323 - 419
Class 5: Excellent flexible	420 - 512

Organisatie flexibiliteit

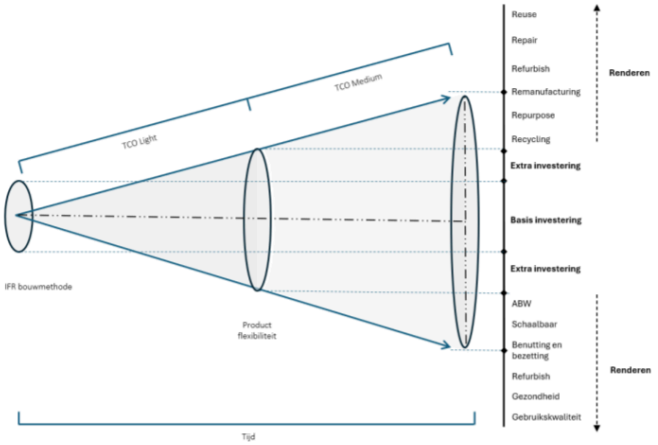




Proces flexibiliteit en TCO



Proces flexibiliteit en TCO



Statements

De grootste barrière voor het realiseren van flexibel vastgoed binnen Defensie ligt **niet** primair in het gebouw of het proces, maar in de culturele en organisatorische starheid, die verhindert om innovatie door te voeren.

Statements

Het inbouwen van ‘werkelijke flexibiliteit’ in het vastgoedportefeuille is van zodanige abstractie en/of complexiteit dat het geen meerwaarde in het portfolio zal opleveren.

Koffiepauze

Casussen

Gebaseerd op scenario's SVP:

- **Koude oorlog**
- Oorlog
- **Vrede**

Casussen komen voort uit intersecties van waarschijnlijke trends (P-I Matrix).

Casus 1 = Technologisch / Ecologisch (KO)

Casus 2 = Technologisch / Ecologisch (KO)

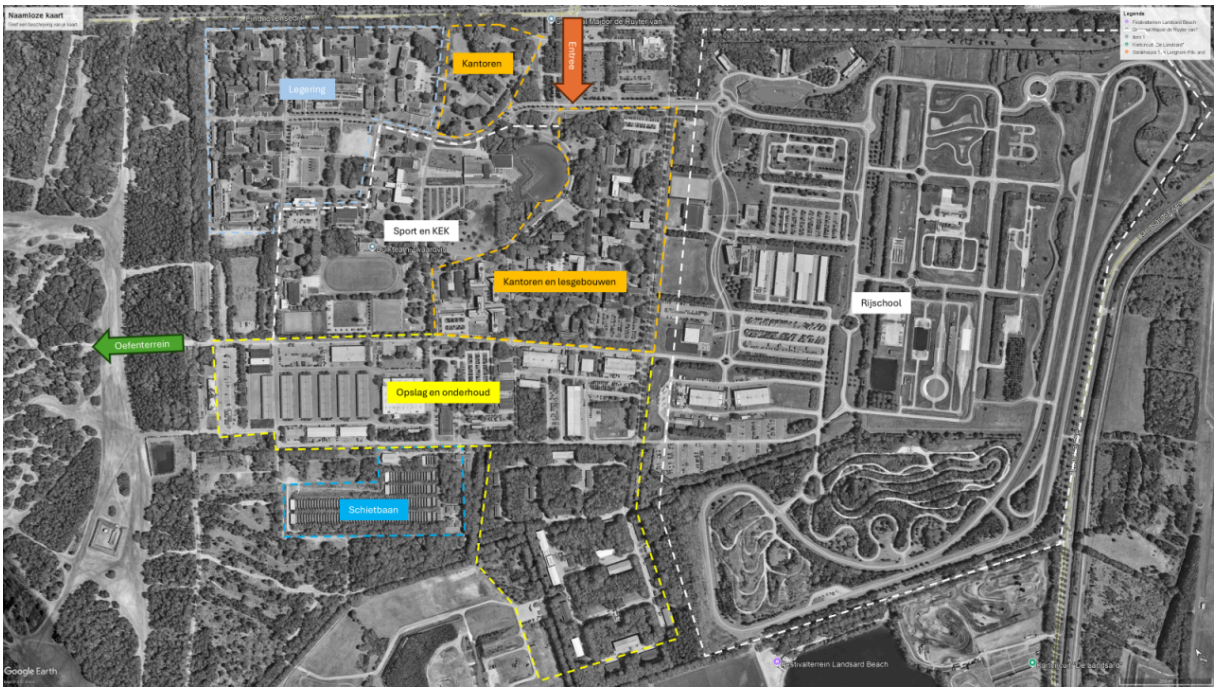
Casus 3 = Demografisch / Bedrijfsvoering (Vrede)

Casussen

Centrale opdracht:
Ontwerp een adaptatiestrategie voor de kazerne in Oirschot op basis van de veranderende missie.

Toon aan hoe, of waarom niet, de circulaire bouwprincipes (IFR, DfA, DfD) het vastgoed in staat stellen te reageren op de veranderende organisatie.

1. Welke DfA/DfD-principes zijn toepasbaar in deze casus, en wat maakt ze effectief of ineffectief in deze context?
2. Welke functies moeten worden aangepast (verplaatst, gecombineerd, verwijderd) en hoe faciliteert het vastgoed dat?
3. Als vastgoed niet responsief is, waar ligt het dan aan: gebouw, proces, organisatie, financiering of iets anders?



Casussen

Reflectie-opdracht (voor afsluiting workshop):

Is DfA/DfD voldoende als middel voor responsief vastgoed? Of ligt de sleutel elders?
Onderbouwing vanuit jullie case-aanpak.

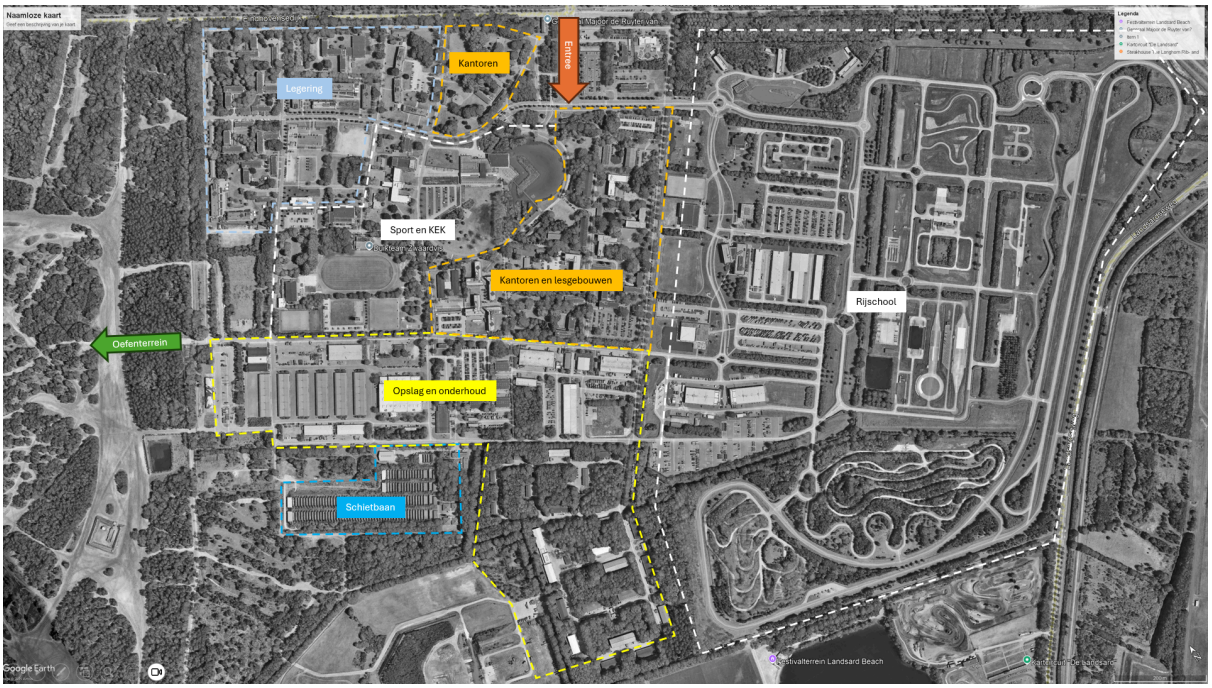
Statements

Defensie heeft op vastgoedgebied, naast de interne verantwoordelijkheden, ook de maatschappelijke verantwoordelijkheid om met haar grootste vastgoedportfolio de circulaire markt op gang te brengen.

Dank!

2025 32

Scenario’s



Scenario 1

Bovenstaand satellietbeeld is van de Generaal Majoor de Ruyter van Steveninckkazerne in Oirschot. Bovenaan bij de oranje pijl is de entree van het terrein. Links bij de groene pijl is de doorgang naar het oefenterrein op de Oirschotse heide, en rechts in het witte kader bevindt zich de rijschool van Defensie. Hier tussenin in de andere kaders op de satellietfoto bevinden zich de kernfuncties van de kazerne, zijnde legering, kantoor, leslokalen, sport, KEK, opslag, onderhoud en de schietbanen.

Aanname & uitgangspunt:

Voor deze oefening wordt aangenomen dat alle gebouwen op de kazerne zijn gerealiseerd volgens het IFR-principe: Industrieel, Flexibel en Remontabel gebouwd, met volledige mogelijkheid tot:

- Herindeling / herontwerp van functies;
- Uitbreiding of krimp van modules, zowel fysiek als functioneel;
- Verplaatsing van gebouwen of onderdelen, zowel intern (op de kazerne) als extern.

De centrale veronderstelling is dat deze circulaire bouwmethode zorgt voor significante tijds- en kostenbesparing ten opzichte van traditionele bouw bij aanpassing of transformatie. Er wordt geen extra vastgoed bijgebouwd: de focus ligt puur op het adaptief vermogen van het bestaande vastgoed.

Context koude oorlog:

Het is 2035. Door aanhoudende droogte, hogere temperaturen en toegenomen klimaatinstabiliteit heeft de regio rond Oirschot te maken met een significant verhoogd risico op natuurbranden. De ligging van de Generaal Majoor de Ruyter van Steveninck Kazerne aan de rand van het bosgebied is nu een kwetsbaarheid.

De regio Brabant-Zuidoost is door het KNMI bestempeld als "risicogebied hoog" voor bosbranden, met name vanwege de combinatie van:

- Droog zandgrond,
- Dichtbebost gebied rondom de Oirschotse Heide,
- Snelle verspreiding van vuur bij harde wind,
- En de gelimiteerde bluscapaciteit op locatie.

De natuurbeheerders, het ministerie van Defensie en omgevingsdiensten hebben gezamenlijk besloten dat: Alle kazernes die grenzen aan bosgebied moeten binnen vijf jaar een bufferzone van minimaal 100 meter vrijhouden van bebouwing aan de boszijde.

Scenario:

Op de kazerne in Oirschot betekent dit concreet dat een deel van de huidige bebouwing (in dit geval tien legeringsgebouwen) binnen deze nieuwe risicobuffer ligt. Deze gebouwen moeten:

- Verwijderd worden uit de huidige locatie, en
- Verplaatst worden naar elders op het terrein, zonder uitbreiding van het kazerneterrein.

Tegelijkertijd is het bosgebied niet verplaatsbaar of kapbaar:

- Het functioneert als essentieel waterabsorptiegebied bij extreme neerslag.
- Het is ecologisch beschermd en draagt bij aan biodiversiteit, CO_2-opslag en verkoeling van het terrein.

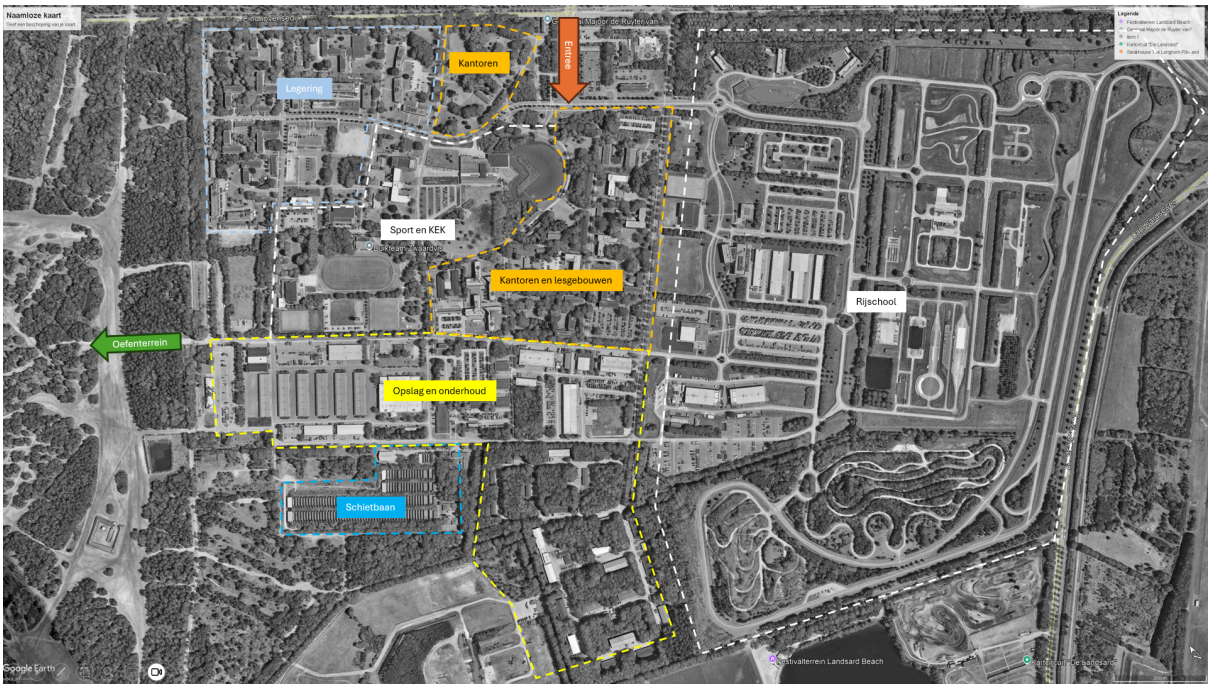
Centrale opdracht:

Ontwerp een adaptatiestrategie voor de kazerne in Oirschot op basis van de veranderende missie en ecologische druk. Toon aan hoe, of waarom niet, de circulaire bouwprincipes (IFR, DfA, DfD) het vastgoed in staat stellen te reageren op de veranderende organisatie.

Thema	**Vragen**
Adaptief vermogen van vastgoed:	Welke DfA/DfD-principes zijn toepasbaar in deze casus, en wat maakt ze effectief of ineffectief in deze context?
Functionele herinrichting:	Welke functies moeten worden aangepast (verplaatst, gecombineerd, verwijderd) en hoe faciliteert het vastgoed dat?
Beperkende factor:	Als vastgoed niet responsief is, waar ligt het dan aan: gebouw, proces, organisatie, financiering of iets anders?

Reflectie-opdracht (voor afsluiting workshop):

Formuleer een beargumenteerde stelling: is DfA/DfD voldoende als middel voor responsief vastgoed? Of ligt de sleutel elders? Onderbouw dit vanuit jullie case-aanpak.



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Aanname & uitgangspunt:

Voor deze oefening wordt aangenomen dat alle gebouwen op de kazerne zijn gerealiseerd volgens het IFR-principe: Industrieel, Flexibel en Remontabel gebouwd, met volledige mogelijkheid tot:

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De centrale veronderstelling is dat deze circulaire bouwmethode zorgt voor significante tijds- en kostenbesparing ten opzichte van traditionele bouw bij aanpassing of transformatie. Er wordt geen extra vastgoed bijgebouwd: de focus ligt puur op het adaptief vermogen van het bestaande vastgoed.

Context ‘de vrede breekt uit’:

Het is 2035. De personele omvang is niet alleen structureel kleiner geworden, maar ook sterk verjongd door nieuwe instroom vanuit het dienstjaar. Jongere militairen stellen hogere eisen aan comfort, privacy, en voorzieningen op het terrein. Er is echter nauwelijks werk beschikbaar op de kazerne zelf door de invulling van de groeistrategie van de krijgsmacht in de koude oorlog periode: opleidingen zijn gecentraliseerd, werkplekken zijn verhuisd naar digitale omgevingen, en materieelonderhoud wordt deels uitbesteed. De huisvestingfunctie verdwijnt grotendeels, terwijl de vraag naar werkplaatsen, ICT-ruimten en tijdelijke werkplekken toeneemt. Deze ontwikkelingen

hebben ertoe geleid dat de traditionele functie van de kazerne als plaats waar gewoond en gewerkt wordt, fundamenteel is veranderd.

Scenario:

Legering is grotendeels overbodig geworden. De meeste militairen wonen thuis of verblijven in de regio en komen met minder regelmaat naar de kazerne.

Tegelijkertijd is er meer behoefte aan:

- Flexibele, tijdelijke werkplekken voor oefeningen, trainingen en inzetvoorbereiding.
- Technische werkplaatsen (denk aan assemblage en onderhoud van moderne systemen).
- ICT-ruimten en cyberomgevingen, o.a. voor simulatie, cyberoefeningen en data-analyse.
- De gebouwen die nu voor legering zijn ingericht, staan grotendeels leeg of onderbenut.

Centrale opdracht:

Ontwerp een adaptatiestrategie voor de kazerne in Oirschot op basis van de veranderende missie en ecologische druk. Toon aan hoe, of waarom niet, de circulaire bouwprincipes (IFR, DfA, DfD) het vastgoed in staat stellen te reageren op de veranderende organisatie.

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Bijlage scenario's

Begrippenlijst:

IFR = Industrieel, Flexibel en Remontabel

DfA = Design for Adaptability

DfD = Design for Disassembly

DfA/DfD-principes:	*Stuff/Space plan/Services*	*Skin/Structure/Site*
Reallocate	Het gebouw is zo ontworpen dat ruimtes intern gemakkelijk kunnen worden heringedeeld. Denk aan flexibele wanden of modulaire units.	De hoofdindeling of functie van het gebouw op locatie kan worden aangepast, zonder sloop of verbouwing van de bouwschil.
Grain size	Het gebouw ondersteunt veranderingen in gebruikersaantallen per unit. Bijvoorbeeld, een verdieping kan worden opgesplitst in kleinere units of samengevoegd tot een grotere, afhankelijk van de bezetting.	Het gebouw als geheel kan functioneren voor grotere of kleinere gebruikersgroepen, zonder dat de omgeving of infrastructuur ingrijpend aangepast hoeft te worden (denk aan parkeergelegenheid of toegang).
Facilities	De binnenkant van het gebouw is voorbereid op aanpassingen zoals het toevoegen of weghalen van sanitaire voorzieningen, keukens, liften of IT-infrastructuur.	Aan de buitenzijde zijn voorzieningen uitbreidbaar of vervangbaar, zoals laadpalen, fietsenstallingen, of dakterrassen met zonnepanelen.
Expansion	Het gebouw bevat binnen structuren (zoals extra trappenhuizen of uitbreidbare gangen) die voorbereid zijn op latere interne uitbreiding.	Er is ruimte op het perceel of in het ontwerp om uit te breiden met extra bouwlagen, aanbouwen of nieuwe vleugels.
Rejection	x	Onderdelen van het gebouw (zoals een vleugel of verdieping) kunnen worden afgesloten of afgebroken zonder het gebruik van de rest van het gebouw te verstoren.
Transfer	x	Delen van het gebouw of zelfs het volledige gebouw kunnen naar een andere locatie worden verplaatst en opnieuw worden opgebouwd.