REMIXING DUNDEE:

FINDING MIXED-USE SOLUTIONS FOR SUSTAINABLE, AFFORDABLE, AND CONNECTED URBAN LIVING IN DUNDEE

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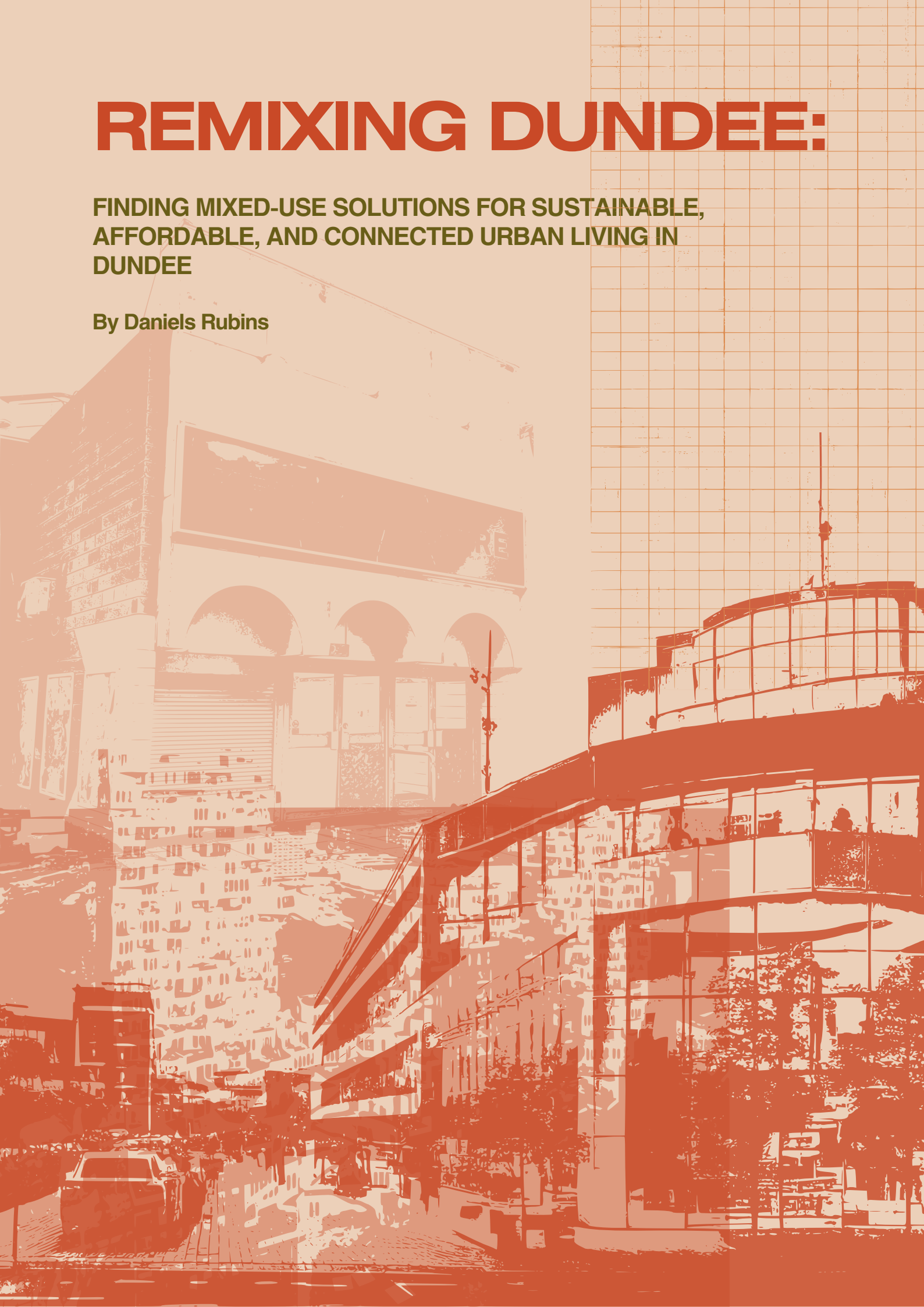

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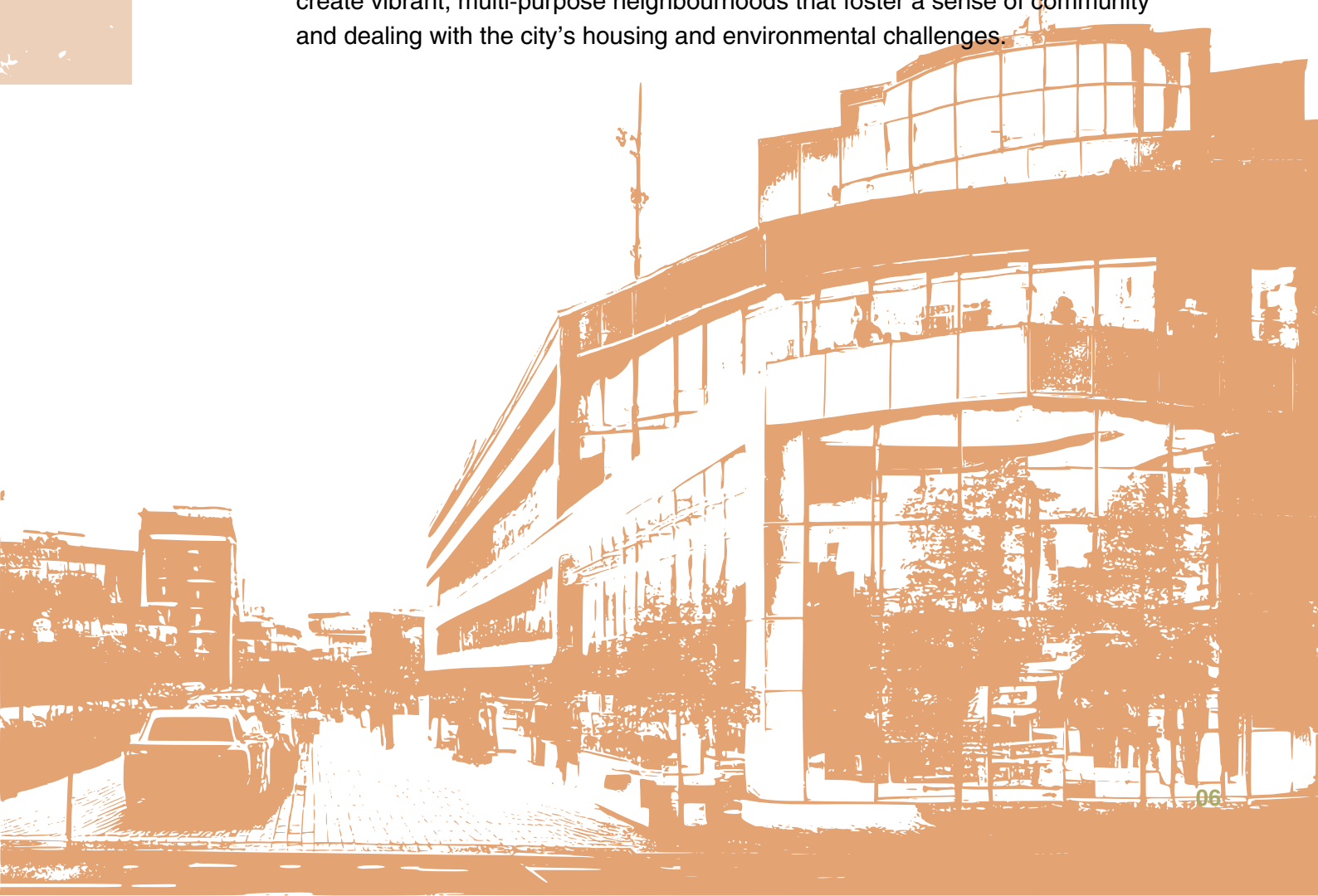
EXECUTIVE SUMMARY

This dissertation explores how integrating co-living, mixed-use and adaptively reused spaces in Dundee's urban environment could deal with key challenges such as housing shortages, sustainability concerns, and lack of community spirit. As Dundee experiences rapid growth, the city faces issues like rising rents, urban sprawl, and a lack of affordable housing. The research investigates the potential of mixed-use developments to create more flexible, sustainable, and connected neighbourhoods.

The dissertation focuses on analysing Dundee's urban challenges, reviewing local and international case studies of mixed-use buildings, and evaluating potential sites for redevelopment. Primary research includes interviews with architects, expert surveys, and site analysis, while secondary research provides context on Dundee's urban issues and best practices in urban design.

Key findings suggest that mixed-use developments can help reduce urban sprawl, enhance social connectivity, and support sustainability. The dissertation recommends adapting existing buildings and integrating mixed-use functions to create vibrant, multi-purpose neighbourhoods that foster a sense of community and dealing with the city's housing and environmental challenges.



GLOSSARY

Mixed-use Spaces: Buildings or areas that blend residential, commercial, industrial, entertainment and even industrial uses into one space

Urban Sprawl: the spread of a city into the area surrounding it, often without planning

Garden City Movement: The town-planning concept aimed to combine the best aspects of both urban and rural environments in modern urban development

Adaptive Reuse: The process of repurposing existing buildings for new functions while retaining their historical features

Co-living: A residential community living model where residents have private living spaces and shared communal facilities

BREEAM: Building Research Establishment Environmental Assessment Method, a sustainability assessment method for planning projects, infrastructure, and buildings

Vertical Urbanization: The concept of building upwards to create multi-functional high-rise structures that serve various urban needs

SHIP: Strategic Housing Investment Plan, a policy framework for addressing housing needs in a specific area

Brownfield Sites: Previously developed land that is not currently in use

Gentrification: a process of urban development in which a city neighbourhood develops rapidly over a short time, changing from low to high value

INTRODUCTION

01

As cities grow and evolve, the ways people live and engage with urban environments are changing rapidly. Increasing demands for flexibility, mobility, and a sense of community, combined with challenges such as climate change, affordability issues, and ineffective urban management, call for innovative solutions. In Dundee, recent transformations in housing production have not adequately dealt with these critical issues (Transform Community, 2024). This presents an opportunity to explore new urban strategies that can effectively address these challenges.

The quality of public spaces plays a crucial role in creating a strong sense of community within cities (Francis et al., 2012). To create thriving urban environments, development strategies must meet the diverse needs of residents. Over the past decade in the UK, approaches such as co-living, mixed-use design, and adaptive reuse have been discovered and used as effective methods for dealing with the mentioned challenges. These strategies helped various groups, including young professionals, students, retirees, expats, and digital nomads (Murray, 2021). This dissertation focuses on how integrating mixed-use developments can help densify Dundee while addressing issues related to housing shortages, sustainability concerns, and weakened society ties.

The research will be conducted through a combination of methods: analysing Dundee's current urban challenges and reviewing case studies of successful mixed-use developments locally and internationally. Interviews with experts in urban design and architecture will provide insights into best practices and potential applications for Dundee. Additionally, site analyses will evaluate the chances of implementing mixed-use solutions in specific locations within the city. The findings aim to propose design interventions tailored to Dundee's unique context, focusing on improving housing accessibility, promoting environmental sustainability, and fostering a stronger sense of community.

METHODOLOGY

02

2.1 RESEARCH AIM

This dissertation aims to explore and understand the possibilities of integrating mixed-use spaces within Dundee's urban environments.

2.2 RESEARCH OBJECTIVES

1. Examine the Urban Challenges in Dundee
2. Explore Mixed-Use Buildings as a Sustainable Urban Solution
3. Analyze Case Studies of Mixed-Use Developments Locally and Internationally
4. Evaluating Potential Sites for Mixed-Use Development in Dundee
5. Explore the visual aspect of how the potential sites could look like in the end
6. Provide Practical Recommendations for Mixed-Use Development in Dundee

2.3 PRIMARY RESEARCH

Structured expert interview with Ufuk Bahar (see Appendix 1.1), Managing Director of Urbanist Architecture. The interview was designed to collect expert insights on the design, functionality, and potential impact of integrating mixed-use spaces within the city context. It also aimed to explore the perceived social and economic benefits of mixed-use developments, along with any challenges they might present in implementation.

Semi-structured interview with Fraser Middleton (see Appendix 1.2), managing director of ARKTX. The interview was conducted with the director to obtain insights relevant to mixed-use models in Dundee. Furthermore, it was also aimed to recognize what could be the social and economic benefits of mixed-use developments, along with any challenges they might present when being implemented.

Site analysis and photographic documentation of potential locations within Dundee, including The Keiler Center, The Old Dundee College, The Old Jute Mill, The Wellgate Centre, and Dens Road Market, provided crucial on-the-ground data. Additionally, a SWOT analysis was applied to evaluate the strengths, weaknesses, opportunities, and threats of potential sites for adaptive reuse and mixed-use development. These analyses helped to assess the feasibility of mixed-use integration in specific Dundee locations, they also gave an opportunity to experience the sites as a local, who passes by every day, and to analyse it from their perspective.

2.4 SECONDARY RESEARCH

The literature review was conducted with the purpose of exploring the concepts of mixed-use developments, as well as researching the urban history of Dundee and how it can be improved nowadays. A range of articles, reports, and academic papers will be reviewed, analysed, and summarized as part of the literature review. This process will provide a deeper understanding of the current state and key concepts in urban development.

Additionally, case studies of successful urban design interventions will be examined to help validate the outcomes of this report. The case studies of Menzieshill Community Hub, “Valley” by MVRDV and “Werk 12” By MVRDV will be researched by exploring articles, reports, and academic papers about the design of the buildings and the experience of the users using them. Furthermore, the research paper will explore case studies of the buildings in Dundee that can be adaptively reused.

2.5 RESEARCH CONSIDERATIONS

This study might face challenges such as bias in expert interviews, where responses could reflect personal views. To combat this, questions were made neutral, and findings were cross-referenced with secondary data. Ethical concerns were minimized by making sure informed consent and confidentiality (if wanted) for participants were ensured.

Measurement issues also arose during research on social and environmental impacts, as these are subjective matters. Established frameworks, such as BREEAM, and analyses of case studies assisted in placing the findings into context. In-depth site analysis was constrained by time, but representative samples and historical data were used to help prove the findings. To structure the research process more carefully, the Double Diamond method was utilized, allowing for a clear progression from problem identification to solution development.

Lastly, limited access to research data was compensated by relying on publicly available information and consultation with relevant people. These approaches ensured that the research was reliable and valid.

DUNDEE

03

In this section, the dissertation will explore the current state of Dundee, its history and issues. Dundee, Scotland's fourth-largest city, is a growing city on the north shore of the River Tay. Known historically for "Jute, Jam, and Journalism," Dundee has transformed from its industrial side into a centre of innovation and creativity, now often referred to as the "City of Design" due to its contributions to design and technology (Dundee City Council, 2012). However, as Dundee grows, challenges like the housing crisis arise due to a lack of affordable homes, rising rents, and not enough available properties. In the last five years, average rents have increased by 56%, raising concerns about being able to afford a place to live for students and low-income families (Bowie, 2023).

3.1 URBAN SPRAWL

The current Dundee housing layout issues take us back to the Industrial Revolution, which introduced urban sprawl by separating areas into residential, industrial, retail, and entertainment zones (Rafferty, 2019). The expansion of industries, like jute mills and shipbuilding, motivated and got people to move to Dundee, this , however, created separate neighbourhoods and factory zones (Tomlinson, Phillips, & Wright, 2019). In the early 20th century, as a response to the sprawl and its effects, the city attempted to adopt the "Garden City Movement", which aimed to improve resident's health by introducing green spaces to counter industrial pollution and overcrowding (Harris, 2017). Even with these intentions, rapid pressures of urbanization and limited economic resources constrained its success. Strict zoning rules within the Garden City Movement contributed to a disconnected urban plan, with isolated neighbourhoods and a lack of community spirit (Griffin, 2018; Rafferty, 2019). Miskel indicates concerns about weakened community ties and city budget overspending, furthermore, it was stated that after the Second World War, the city started to adapt for cars, rather than walking, which contributed to massive CO2 emission creation (2002). All of this contributed to the current housing crisis, as isolated urban sprawl left Dundee struggling to meet the demand for affordable, connected living spaces.

3.2 CURRENT SITUATION

Nowadays, to fight the housing crisis, Dundee City Council has launched the Strategic Housing Investment Plan, called SHIP, which was supported with over £89 million by the Scottish Government funding from 2022 to 2027 (Christopher, 2024). Even with these efforts, the construction company fell behind schedule, only 220 of the targeted 480 houses were recently built (Christopher, 2024). As Dundee faces this shortage, the need for affordable housing pushes many young and low-income residents to move away because of high rent costs. This migration weakens society ties and impacts the economy (Dundee City Council,

2024). Another issue raised by interviewee Fraser Middleton (2024) was that Dundee focuses on new builds rather than redeveloping and repurposing existing structures, which could offer a quicker and more sustainable solution to the housing shortage. Interviewee Middleton (2024) noted that adaptively reusing buildings and integrating mixed-use spaces within them would provide not only affordable housing but also essential neighbourhood amenities, finding a solution for both social and economic needs.

3.3 SUSTAINABILITY ISSUES

Dundee's increasing need for housing is linked with challenges around sustainability. Increased construction produces more carbon emissions and waste generation, this shows the importance of sustainable building practices that match the Scotland's environmental goals (Pederson, Keddie, & Brown, 2008). Also, the continued use of single-purpose areas, like zones only for housing or work, creates issues and limitations. Such zones experience peak activity only during certain hours in a day, and are left empty and unused otherwise. (Tomlinson, Phillips, & Wright, 2019; Calafati et al., 2023, Middleton, 2024).

MIXED-USE BUILDINGS AS A SOLUTION

04

In the previous section, the state of Dundee was discussed, however, this section looks into the reasoning behind why mixed-use developments are a possible solution to these issues. It explores the concept of mixed-use spaces as a solution to Dundee's urban challenges, such as housing shortages, sustainability concerns, urban outmigration, and weakened society ties. To understand the potential of mixed-use buildings, it is important to first understand their purpose. Although not a new concept, mixed-use developments have gained popularity due to the upcoming problems such as the housing crisis, growing awareness of sustainability, and the rise in loneliness following the COVID-19 pandemic (Ashton, 2023). The mixed-use spaces can combine various functions, such as housing, offices, retail, and recreational areas, increasing the popularity of shared spaces, flexibility, and mobility (MVRDV, n.d.).

4.1 PURPOSE AND BENEFITS

To recognize how mixed-use developments can improve city neighbourhoods, it is important to understand what the negative sides of single-use zoning are, cities where residential, commercial and recreational zones are separated into specific areas based on their use. This is what Dundee looks like at the moment, neighbourhoods are designed for just one purpose and this creates multiple issues for the residents. For example, an area with just residential buildings comes across the issue of having fewer amenities within walking distance, as the area during the day, when residents travel to work, becomes isolated. The same goes for other types of neighbourhoods for different times during the day. The appeal of mixed-use spaces lies in their ability to transform single-use, malfunctional environments like Dundee's, into vibrant, multifunctional neighborhoods (Khakzand, 2016). Research indicates that integrating mixed-use spaces could deal with inefficiencies linked to monofunctional zones, which often contribute to congestion and reduced sustainability (Zaletova, Ismagilova, & Arsenteva, 2021). By adopting mixed-use principles, Dundee could rethink its city plan, meeting both, its housing and social needs. However, interviewee Ufuk Bahar (2024) points out that while high-density cities typically benefit from mixed-use spaces due to limited space, demand may be less apparent in lower-density cities like Dundee. Even with this, the ongoing housing crisis and sustainability challenges underscore the need for adaptable, mixed-use solutions to improve affordability and usefullness.

4.2 COMMUNITY AND SUSTAINABILITY

Interviewee Middleton (2024) marks the importance of mixed-use spaces in dealing with Dundee issues, explaining that “mixing residential, commercial, and communal uses not only makes neighbourhoods more bonded together but also reduces the environmental footprint by reducing the distance travelled to reach a certain space.” With mixed-use developments, Dundee residents could gain access to workspaces, shops, and essential services within a short walk. In that way city of Dundee could develop not just the social aspect of the city but reduce the CO2 emissions as well by reducing the need to use cars in Dundee.

Although Dundee Council tried to resolve the issues of the housing crisis by building more single-purpose housing, Middleton (2024) points out that this current strategy often does not look at the social and environmental aspects, furthermore, it is only fueling urban sprawl and bigger resource consumption. Interviewee Middleton (2024) insists on the change of the construction plan of Dundee, where mixed-use spaces could be planned and built within the city’s expansion. Interviewee Bahar (2024) talks about the idea that mixed-use developments could be much more emotionally impactful than single-use buildings, as they can be designed to reflect local culture, providing a sense of community and belonging among that city's residents. Also, Bahar (2024) thinks that, while adaptation of existing buildings can be challenging, it can become an amazing chance to increase social interaction and neighbourhood well-being through adaptive reuse. Ufuk Bahar (2024) isn’t similar to Dundee's challenges, however, his approach reinforces the potential of mixed-use spaces that can be both sustainable and society focused.

4.3 CO-LIVING

This paragraph will explore the concept of co-living, which Bahar (2024) mentioned in the interview as a sub-type of mixed-use buildings. Co-living is an innovative housing strategy that integrates private living spaces with shared communal areas and facilities, with the purpose of creating neighbourhood interaction while providing low-cost accommodation options. This modern approach to shared housing provides lots of benefits for both residents and the environment. According to Malmqvist and Brismark (2023) co-living designs can lead to lots of carbon savings compared to traditional apartment designs, with reductions ranging from 17–35% when normalized per floor area and 20–39% when normalized per capita. Furthermore, co-living arrangements provide improved facilities, and space-efficient density, while offering opportunities for residents to develop life skills and build social connections (Drew, 2023). This is especially good for young professionals, students, and individuals looking for a more collaborative living environment in urban environments. However, building successful co-living projects requires careful consideration of architectural plans,

such as providing optional interaction spaces depending on society interests(Future, 2024). As housing inquiries continue to evolve, co-living represents a promising idea that deals with both social and environmental issues in the city, offering a potential solution to the challenges in Dundee.

4.4 ADAPTIVE REUSE

This paragraph will explore the idea of adaptive reuse, as during research it was discovered that the concept of adaptive reuse goes well together with developing mixed-use buildings which was also approved and encouraged by Middleton (2024). As cities adapt to modern societal needs while preserving their cultural heritage, adaptive reuse becomes a vital strategy. Retaining historical elements while repurposing them for casual use ensures that cities like Dundee can honor their past while building a sustainable future (Foster, 2020). Adaptive reuse, the process of repurposing existing buildings for new functions, offers a sustainable and cost-effective approach to urban development. In Dundee, this strategy can deal with housing shortages, and promote sustainability. Repurposing existing structures reduces the need for new materials, therefore saving resources and minimizing waste. This approach lowers carbon emissions connected with building materials and the construction process. For instance, adaptive reuse can lead to substantial reductions in embodied carbon compared to traditional apartment designs, with savings ranging from 10–20% per floor area (Suleiman, 2024). Moreover, adaptive reuse can save the architectural history of a city therefore saving its unique character and identity. For example, readapting historic buildings can create spaces that show off local culture and history, improving residents' sense of belonging (CJRD, 2023). Using adaptive reuse in Dundee provides a solution to urban issues. The city can enhance sustainability, stimulate economic growth, and foster a stronger sense of community by repurposing existing buildings into mixed-use developments. This dissertation seeks to explore how mixed-use developments can bridge these priorities by creating vibrant neighbourhoods that balance functionality with cultural preservation.

MIXED-USE CASE STUDIES

05

This section provides a detailed exploration of case studies on mixed-use developments, in order to get insights into their design, functionality, and impact on the environments. By exploring real-world examples, this analysis focuses on how mixed-use buildings operate in real life, offering lessons that can help future projects in Dundee. The main focus of the section is on two things: first, to discover the potential of mixed-use spaces to deal with the city's issues, such as the housing crisis, and urban sprawl and second, to rate how these developments can improve sustainability and society engagement.

5.1 MIXED-USE SPACES IN DUNDEE

While mixed-use buildings are currently a rare occasion in Dundee, they have great potential for the city's improvement. An amazing example is the Menzieshill Community Hub, which opened in 2020. This facility combines within itself various neighbourhood services and facilities, including education, healthcare, leisure, and sports, in a single location, in that way improving the Menzieshill area liveability (Scottish Design Awards, 2020). Furthermore, the hub's flexible design features a library, multi-purpose rooms, and youth spaces, demonstrating how mixed-use buildings can combine multiple functions. This initiative shows that Dundee City Council has begun exploring mixed-use development concepts. However, additional projects are needed to be built to deal with the city's needs. It’s also important to mention that even with its adaptive facilities, during personal site visit, it was noticeable that the Menzieshill Community Hub experiences periods of low activity during off-peak times like daily mornings, showcasing that community engagement may not be as big as planned by the council. This observation shows the importance of society's involvement in the design process to ensure such spaces remain used and busy.

FIGURE 1

5.2 MIXED-USE SPACES BY MVRDV

FIGURE 2

While Dundee is in the early stages of building mixed-use spaces, cities like Amsterdam have long used such ideas. The "Valley" project in Amsterdam, designed by MVRDV and completed in 2022, is a great example of this approach. It combines commercial, residential, and public spaces, including an accessible garden, all within a single structure. "Valley" is also inspired by the trend of "vertical urbanization," where high-rise buildings serve not only as places for work and residence but also as public areas that encourage interaction between people. The design has publicly accessible spaces, such as the "Valley Floor" on the 4th and 5th floors, and the “Grotto”, which acts as a living room for daily social connections (ArchDaily, 2017). The building's atmosphere is made through a contrast between the external reflective glass facade and the internal natural stone terraces, creating a smooth transition from corporate to human-scale environments. Approximately 13,500 plants inside the gardens, designed by Piet Oudolf, develop the sense of society by providing year-round green spaces that serve as gathering points (Daily Architecture News, 2022). "Valley" has transformed Amsterdam's Zuidas from a business district into a livable neighbourhood by building 196 apartments, offices, retail spaces, and cultural facilities. The project is under local energy regulations by 30% and has achieved BREEAM-NL Excellent certification, showing its commitment to sustainable neighbourhood development (Daily Architecture News, 2022). Furthermore, Each of the 198 apartments has a unique floor plan, ensuring different living spaces while giving optimal daylight and privacy conditions for every flat. For cities like Dundee, which may face issues such as gentrification, adopting vertical urbanization strategies could enhance livability by incorporating green spaces and gathering social connections through shared facilities.

Another great example is MVRDV's "WERK12" in Munich, which readapted a former industrial site into a multifunctional space gathering offices, restaurants, gyms, and public areas. The design's flexibility, with high ceilings and adaptable spaces, offers great insights for Dundee on implementing future-proof mixed-use sites that can change with changing needs. Such adaptable designs improve space use and promote sustainability by deleting the need for demolition and need to renovate when repurposing buildings (ArchDaily, 2019). WERK12 improves human interaction through its unique circulation system, which includes 3.25-meter-wide terraces around the building, furthermore, each floor has external staircases that blur the line between interior and exterior spaces. The building's atmosphere is developed by transparent facades and floor-to-ceiling glass walls, in that way keeping a constant dialogue with the surroundings and transforming from simple geometries during the day to a pretty light display at night (Stevenson, 2019). The development gathers a sense of community by serving as a main point for the growing Werksviertel-Mitte neighbourhood, housing a diverse mix of facilities, including ground-floor restaurants and bars, a three-story gym with a swimming pool, and offices on the top floor. Furthermore, the design's flexibility is made by keeping its extraordinary 5.5-meter-high ceilings, allowing for future adaptations through other developments such as mezzanines or level changes, ensuring the building can evolve with changing society needs while keeping its structural integrity (ArchDaily, 2019). This project is a great example of how thoughtful architectural design can change old unused industrial sites into busy urban centres, creating sustainable, multifunctional spaces that serve neighbourhoods. This approach to urban regeneration made by MVRDV provides great insights for cities like Dundee, in order to develop mixed-use projects that can evolve over time while keeping strong society ties.

FIGURE 3

POSSIBLE SITES AND REAL-LIFE ANALYSIS

06

The adaptive reuse of existing buildings and the development of mixed-use spaces are the main strategies in addressing urban challenges such as housing shortages and urban sprawl. This dissertation explores the potential of these approaches within the context of Dundee, Scotland, focusing on the redevelopment of key sites to create sustainable, affordable, and connected urban living. That's why it was decided to conduct a detailed primary and secondary analysis of possible development sites including the Keiller Centre, the former Dundee College on Constitution Road, the Wellgate Centre, Dens Road Market, and the Old Jute Mill. The next section will explore the opportunities and challenges connected with adaptive reuse and mixed-use development of the mentioned case studies in Dundee. The findings will provide policy recommendations and future research directions that can help Dundee's urban regeneration efforts, ensuring that redevelopment ideas not only save the city's architectural heritage but also meet the needs of Dundonians.

5.1 CASE STUDY 1: THE KEILER CENTER

FIGURE 4

The Keiller Centre in Dundee, built in the late 1970s, has faced plenty of challenges in adapting to retail trends, leading to its decline over recent years. Its central city location remains a good strength, giving excellent accessibility and visibility for potential renewal. However, the building's structural limitations, like large spaces without any windows and design structure that is not flexible at all, present big weaknesses that make it almost impossible to apply adaptive reuse for mixed-use development. Nevertheless, in response to these challenges, proposals have been sent to the council in order to repurpose the site into the "Keiller Quarter," introducing a mix of student accommodation, commercial spaces, and public areas. This proposal aims to breathe new life into the city centre, in that way evolving one of Dundee's oldest shopping centres. (Devlin, 2024) Unfortunately, even with all the

FIGURE 5

FIGURE 6

potential benefits, the project is getting declined by the council over and over mainly because of the high redevelopment costs, planning restrictions, and competition from other development sites in the area.

This case study points out the complexities of the process as designers have to deal with plenty of things at once, it happens especially when dealing with structures that have outlived their original purpose and shows. Furthermore, it shows the importance of considering long-term flexibility in architectural design to make sure buildings remain useful to their communities over time which also complicates the design process. The site could still be redeveloped, but it would likely require a more fundamental approach, including demolition and new construction, which is a common issue for many sites in Dundee (Fraser Middleton, 2024).

6.2 CASE STUDY 2: OLD DUNDEE COLLEGE

The former Dundee College building on Constitution Road, built by the Dundee Council between 1966 and 1969, has been abandoned since 2003, presenting both challenges and opportunities for reconstruction (Jonathan, 2021). Its great location near the city centre that offers stunning views and is close to Dundee's centre, making it an attractive option for redevelopment. Despite years of disuse, the building remains standing, providing a great opportunity for adaptive reuse. However, the current site, designed for educational purposes, may need significant modifications to accommodate new functions, which could raise up redevelopment costs. Proposals have been made to convert the building into high-quality student housing because there is a rising need for such accommodations in Dundee (Jonathan, 2021). The spacious site allows for the creation of residential units with communal areas, study spaces, and recreational facilities, promoting a lively neighbourhood atmosphere. Nevertheless, obtaining the necessary planning approvals and following building regulations could present plenty of issues, potentially slowing down the redevelopment timeline. Additionally, local residents have concerns about increased traffic, noise, and parking issues that new developments might bring (Dundee City Council Planning Committee, 2021).

In conclusion, while the former Dundee College building poses certain challenges, its advantageous location and structure offer significant potential for successful redevelopment. Facing design limitations and community concerns through careful planning and engagement with society will be much needed in creating a project that positively impacts Dundee.

FIGURE 7

6.3 CASE STUDY 3: WELLGATE CENTRE

The Wellgate Centre in Dundee, once such a popular place for shopping, is now left with very few occupants and just a few visitors on site daily as conducted during the personal visit. It is now being debated on what new use it would be changed to. Therefore, it is very centrally placed with the best accessibility and visibility, thus, making it one of the best sites for adaptive reuse. However, because the structure has been designed mostly for retail, it may take lots of modification to really get it to accommodate new functions, therefore raising the costs of redevelopment. Fortunately, at the Wellgate Shopping Centre, budgeted under the £265 million redevelopment scheme, Dundee and Angus College recently gave a glimpse of its plans for relocating its Dundee campus to a “state of the art” facility (BBC, 2024). This proposes the renovation of an area through the introduction of educational facilities right inside the Wellgate centre, therefore, foot traffic and economic activity are more likely to grow. However, planning permissions and building regulations would be challenging as Wellgate Centre is a windowless shopping centre which has long and empty corridors which is the opposite of what educational facilities need, all this will delay the redevelopment.

FIGURE 8

To conclude, Wellgate's strategic location offers great potential for future successful redevelopment. The careful, thoughtful engagement and planning with and dealing with these design constraints and concerns by people will be essential for realizing a project that positively contributes to Dundee's urban landscape.

6.4 CASE STUDY 4: DENS ROAD MARKET

FIGURE 9

The Dens Road Market in Dundee, once a bustling and hustling hub of activity, has degraded a lot since its closure in 2013. The building's structure has been destroyed, with the roof collapsing in 2022, the site was from that moment admitted as unsafe and contributing to its status as one of Dundee's most prominent eyesores (Dundee City Council, 2008). Additionally, the site has been subject to vandalism and neglect, further destroying its condition. The surrounding area has also faced challenges; for example, Scottish Water completed complex emergency repairs on Dens Road in November 2024, in order to fix issues with the water main and sewer system in the area (Dundee City Council, 2024).

FIGURE 10

Dens Road Market and its central location offer excellent accessibility and visibility, making it a prime candidate for redevelopment. However, the mentioned infrastructural problems mark the challenges in maintaining and repurposing properties in this part of Dundee. The market's current bad state creates big obstacles to redevelopment so it would be much easier and cost-friendly to destroy the market and build a new building.

6.5 CASE STUDY 5: THE EAGLE MILLS

FIGURE 11


FIGURE 12

The old jute mill “Eagle Mills” in Dundee stands as proof of the city's rich industrial heritage, reflecting its historical importance during the "Juteopolis" era. Strategically located, the mill offers excellent accessibility, increasing its appeal for various renovation initiatives. However, the building's age and original industrial design present multiple issues, including potential structural problems and layouts that may require plenty of investments to adapt for modern use. Unfortunately, some mills, such as the Wallace Craigie Works, have been demolished even though it had historical importance. Despite that, the Eagthe mill's distinctive character provides a unique opportunity for mixed-use development, as evidenced by the £3.5 million redevelopment plan for Eagle Mills on Victoria Street, which aims to create residential apartments, a nursery school, and commercial spaces (Giblen, 2018). Successful adaptively reused buildings like Manhattan Works on Dundonald Street further demonstrate the potential for transforming industrial sites into flexible and adaptive spaces. However, big redevelopment costs, potential contamination from previous industrial activities, and the challenge of balancing keeping historical context with modern needs create big obstacles. The case of the Eagle Mills showcases the broader issues involved in repurposing industrial heritage sites, it marks the need for a careful balance between saving the history value and addressing neighbourhood development needs while contributing to Dundee's evolving economic landscape.

CHALLENGES

07

From the case analyses it became clear that there is a huge potential for Dundee to create co-living, mixed-use developments, this way addressing housing shortages, urban sprawl, and sustainability issues in Dundee. However, this solution has plenty of challenges - regulatory, cost implications, acceptance by the community, and design.

Zoning

Dundee Council has zoning laws which regularly separate residential from commercial and recreational spaces (Spladmin, 2024). The traditional laws allow for the combination of such functions within a neighbourhood but not within a building, therefore it can not become mixed-use, this can only change if the city council edits the regulations. These very unusual norms create barriers to the conversion of older buildings and adaptive reuse, therefore making it unattractive for developers to invest in innovative mixed-use projects.

Economics

As discussed, adaptive reuse is a great way to develop mixed-use sites in the city. However, for example, sites such as the Keiller Centre or the Old Jute Mill require structural modifications that are costly. Furthermore, developers have to prove to the council that the projects will be profitable in lengthy terms, which is tough in a city where housing demand keeps changing with economic uncertainty.

Community and Utilities

Mixed-use development should engage all local neighbourhoods with the needs they serve. The history of urban sprawl and disconnected neighbourhoods in the city of Dundee proves that the city needs it, however, it might be a long and complex task because the community is used to such a lifestyle and it is hard to change something people are used to (Hafström, 2021). Despite this, ideas from international case studies should be adapted, as they are, to suit the cultural uniqueness of Dundee to make the following possibilities not happen: gentrification or displacement of current residents.

Design

Designing mixed-use development in Dundee is a complex task. The design should guarantee privacy for the residential areas while the commercial and public areas will remain accessible and lively. For example, such projects as MVRDV's "Valley" in Amsterdam show how private-public transition spaces can be in part successful, and yet, it is quite hard to replicate here in Dundee due to the scale limits of the city in comparison to funding (Manen, Brown, and Phillips, 2024).

Sustainability

Without a doubt, sustainability stands out as almost the ultimate goal of mixed-use developments, and very often, it remains an elusive one. As seen with the Dens Road Market and the Old Dundee College renovating older buildings often reveals problems like structural damage. Furthermore, targets of achieving environmental goals, such as lowering carbon emissions and introducing renewable energy systems, add to the complexity and cost in order to achieve such sustainability (Smith, 2024).

Investors and contributors

Such mixed-use projects need to exist through generations of cooperation between local government, architects, and civil society organizations. Disagreements between stakeholders can lead to delays and increased costs (Friedman, 2023). For example, debates over balancing heritage preservation and financial viability have delayed renovation plans for the Wellgate Centre.
In summary, while mixed-use developments could bring great benefits to Dundee, these challenges show the need for careful planning, collaboration, and innovation to overcome barriers.

CONCLUSION

08

8.1 RECOMENDATION

To deal with Dundee's urban challenges effectively, the city should prioritize several strategies. Firstly, adaptive reuse should be in the first place when it comes to urban development policies. By repurposing underused or abandoned buildings, such as the Dens Road Market and Old Dundee College, Dundee can preserve its architectural heritage while reviving its neighbourhood. This strategy not only modernizes how the city deals with renovations but also breathes new life into abandoned spaces.

At the same time, mixed-use sites should integrate residential, commercial, and recreational parts into one space with different developments so that this would create functional neighbourhoods. This should also reduce urban sprawl and damage to the environment, which happened with successful international examples like "Valley" and "WERK12".

The success of these strategies depends on meaningful collaboration among all people connected, including residents, businesses, and civic organizations. Involving the community in the planning and design of energy-efficient, mixed-use spaces ensures that these developments meet the needs and aspirations of local neighbourhoods. Inclusive participation fosters a sense of ownership and helps create urban spaces that truly serve their communities.

Flexible zoning regulations and financial support are needed to encourage innovative urban projects. Changed council rules for mixed-use developments, combined with funding support, can inspire creative solutions and attract investment. Promoting green building practices like “vertical urbanisation” and improving public transportation infrastructure should also be part of the strategy, as these efforts can reduce environmental impact and improve the quality of life in Dundee.

Ongoing research into mixed-use developments is very needed to understand their long-term impact. By conducting studies on the social, economic, and environmental outcomes of these projects, Dundee can gather insights to guide future initiatives. Exploring how new technologies can improve the functionality of mixed-use spaces will also help ensure that upcoming projects are both innovative and effective.

By focusing on these strategies, Dundee can deal with its issues while creating a sustainable, liveable, and inclusive city for the future.

8.2 VISUAL REPRESENTATION

The purpose of this paragraph is to explain in detail the visual aspect, with AI-generated examples, of how the analyzed case studies could look in adaptively reused and redesigned mixed-use buildings. For example, the adaptive reuse of the Old College Building merges heritage preservation with modern functionality. Visual examples show a modernized façade that respects the building's historical character while incorporating glass extensions and contemporary materials.

FIGURE 13

The adaptive reuse of Wellgate Centre envisions a transformation from a declining shopping mall into a vibrant mixed-use hub. Renderings showcase a dynamic façade with modern glass features interspersed with preserved structural elements, creating an appealing blend of contemporary and historical design. Green spaces, including rooftop gardens and vertical greenery, enhance biodiversity and offer recreational areas for residents and visitors.

FIGURE 14

FIGURE 15

Also, the design shows the rehabilitation of the Old Jute Mill by maintaining its industrial character into a mixed-use building, having commercial areas at the ground level and residential above.

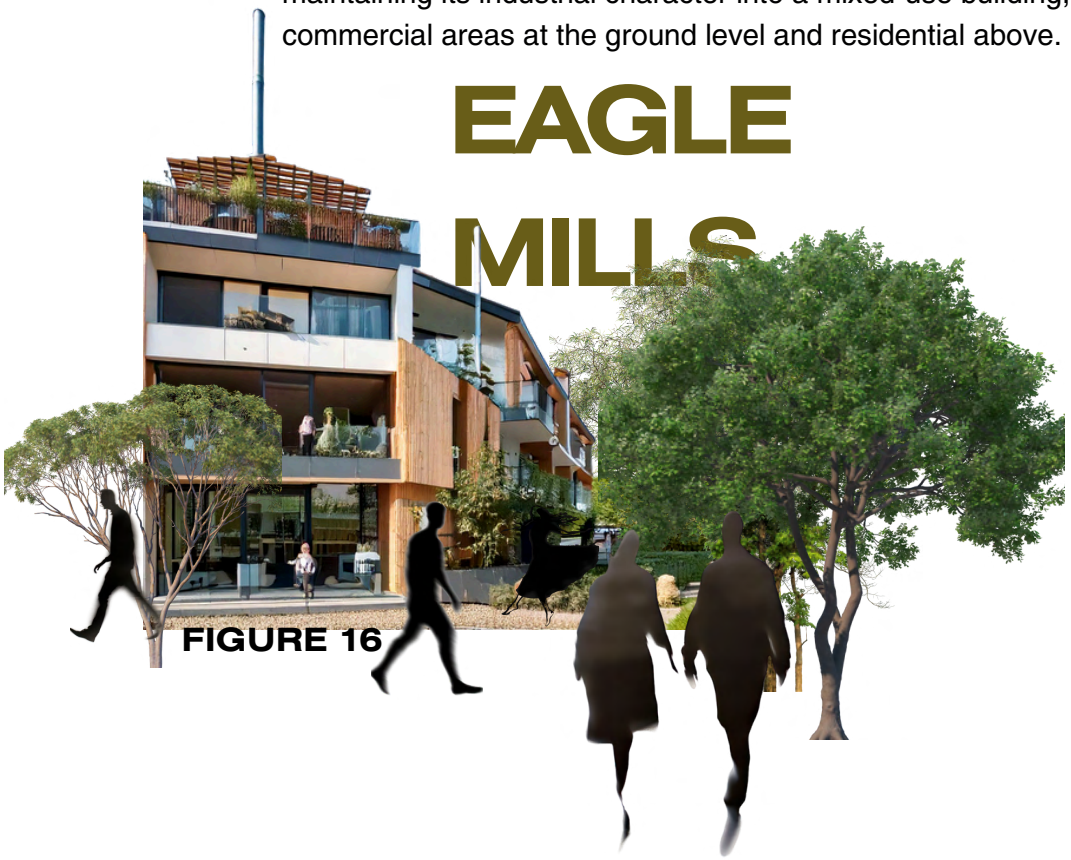


FIGURE 16

The transformation of the Keiller Centre into a mixed-use development is illustrated through renderings that integrate historic features with sleek, modern design. The façade receives a facelift, combining preserved stonework with innovative architectural elements like wood curtain walls.

FIGURE 17

The revitalization of Dens Road Market focuses on redeveloping the historic market into a thriving community space. Renderings illustrate open-air courtyards surrounded by coworking spaces, retail shops, and cafés.

FIGURE 18

8.3 FINAL WORDS

The research of mixed-use solutions for sustainable, affordable, and connected living in Dundee shows a complex but promising path how to improve the quality of living in Dundee. The research findings mark the potential of mixed-use spaces to deal with challenges facing Dundee, including housing shortages, urban sprawl, and the need for more liveable, sustainable neighbourhoods.

Case studies and expert insights demonstrate that successful mixed-use developments can create multifunctional neighbourhoods that radiate a strong sense of community, reduce environmental impact, and stimulate local economic growth. Great examples as the Menzieshill Community Hub in Dundee and international projects like MVRDV's "Valley" in Amsterdam provide much needed lessons in combining diverse functions within one single site.

However, implementing mixed-use strategies in Dundee is not without challenges. The city's existing plan, regulatory environment, and market conditions will require lots of work and potentially lots of adjustments to fully realize the benefits of mixed-use development. The adaptive reuse of existing structures, especially those with historical importance, presents both opportunities and obstacles that must be approached with attention.

As Dundee continues to evolve and deal with its urban issues, the research shows how mixed-use developments can create more liveable, connected, and active neighbourhoods. By choosing this approach, Dundee has the opportunity to transform its future, saving its rich history from destruction while meeting the needs of current and future generations.

While mixed-use development is not an answer for all of Dundee's issues, it offers an impressive and powerful tool for creating more sustainable, affordable, and connected neighbourhoods. By thoughtfully integrating different functions within its urban spaces, Dundee can work towards a future that honours its past while embracing the possibilities of shared living.

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