

Towards a Transformative Housing Model for the City of Cape Town, South Africa



WPI

Written By:
Isabelle Lachaux
Lorena Nunes
James Obermaier
Samuel Ott

Towards a Transformative Housing Model for the City of Cape Town, South Africa

An Interactive Qualifying Project Report Submitted to the Faculty of WORCESTER POLYTECHNIC INSTITUTE in partial fulfillment of the requirements for the Degree of Bachelor of Science

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Submitted By:
Isabelle Lachaux
Lorena Nunes
James Obermaier
Samuel Ott

Submitted To:
Duke Gumede,
Human Settlement Directorate, City of Cape Town
Professors Gbetonmasse Somasse and Thidinalei Tshiguvho,
Worcester Polytechnic Institute

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Abstract

This project aims to assist the City of Cape Town’s Human Settlement Directorate (HSD) in proposing for an innovative housing model that would be sustainable and integrative. We interviewed engineers, urban planners, NGOs, and marketing experts and conducted documentary research through case studies of similar projects and legislative documents outlining government policies. We synthesized 9 key findings addressing the lack of social amenities, importance of location, need for collaboration, and social inequities in Cape Town. We also created a document we called “Proposed guidelines for a Transformative Housing Model.”

Executive Summary

Background

Remnants of social and civil unrest remain in Cape Town despite nearly three decades passing since the end of the apartheid era in South Africa. The city still faces many challenges, one of the most prominent being the housing crisis. The “Apartheid City” housing framework established segregated sections of the city which has led to areas of economic and social disparity. This has given disenfranchised groups a significant lack of opportunity for social mobility, and the housing supply deficit continues to increase.

According to household income statistics collected in 2020, 76% of households in Cape Town qualify for affordable housing from the government (City of Cape Town, 2022, p. 21-22). Previous government relief efforts have been unsuccessful in meeting housing demands. Historically, efforts have been engineering centered, focusing on providing a structure without accounting for cultural, political, or environmental considerations of the area.



IMAGE 1: PHOTO TAKEN OF AN INFORMAL SETTLEMENT CALLED KHAYELITSHA IN CAPE TOWN SOUTH AFRICA.

This lack of human- centered design created unwanted housing which only placed further dissatisfaction and burden on the residents and on the city (CSIR, 2000).

The city of Cape Town’s Department of Human Settlement’s latest approach to provide housing is the creative development of mixed-program housing models. New housing projects

must account for community feedback, governmental regulations, and financial considerations. Ideally, the new housing design will mitigate a significant crisis for unhoused residents, promote a mixed-use framework for future land development, and advocate for amending inequitable housing conditions left from the Apartheid era.

Project Goal and Objectives

The goal of this project was to develop a mixed-program housing model for the repurposing of underutilized commercial and industrial properties into “transformative housing developments.” To achieve the goal of our project, our team broke it down into 3 measurable and attainable objectives:

1. Identify the elements of transformative housing by examining mixed program models in affordable housing implemented in the past.
2. Determine through interviews stakeholders' perspectives and preferences on repurposing properties into transformative housing
3. Develop a model for the repurposing of industrial and commercial buildings into transformative housing properties.

Methods

To achieve these objectives, our team conducted documentary research and conducted interviews with experts to obtain information on the physical development process and the social aspects to consider. The documentary research consisted of analyzing previous mixed housing model projects along with government housing policy documents. The three developments were: Belhar CBD Integrated Human Settlements Development, Fleurhof Integrated Human Settlements Development, and Pickwick, two of which have already been built and the third is still in proposal stage. Analyzing previous projects gave insight on successes and failures of past projects to identify which factors are important for a transformative housing model. Government policy documents analysis outlined the legal framework and financial process of developments as well as the government plans for future housing developments in Cape Town.

We conducted semi-structured interviews with experts such as urban planners, engineers, architects, NGO representatives, financial institutions,

and marketing experts. Targeted questions for different experts were asked to understand essential social requirements as well as physical feasibility of affordable housing projects in the city of Cape Town. The purpose of interviewing NGOs was to assess the social needs of potential residents. Interviews with Engineers and urban planners informed us of the process for creating affordable housing as well as a community. Finally, interviews with a real estate agent and a financial institution gave insight on funding strategies for new housing developments and marketing tactics tailored to specific stakeholders.

Connectivity, Ownership, and Inclusivity: Key Findings on Affordable Housing

Based on our research, we developed the following nine findings which we used to guide our recommendations for the Transformative Housing Model.

Finding 1: Properties with high connectivity to the surrounding area are good targets for transformative housing model.

Basic social amenities are necessary for a well-designed social housing project. This social infrastructure might include healthcare, education, childcare, utilities, and more. While reviewing two social housing project proposals we found that site connectivity to the surrounding area can improve shortfalls that can come with the lack of social infrastructure.

Finding 2: There is an optimal ratio of subsidized versus open-market housing that can be provided in a development while still being financially feasible

The three case studies, analyzed in methods, gave information on how to break down the floor space and

To be deemed feasible, a site should have reasonable access to:

- | | |
|---|---|
| <ul style="list-style-type: none"> <input type="checkbox"/> Transportation <ul style="list-style-type: none"> <input type="checkbox"/> A MyCiTi bus stop <input type="checkbox"/> Golden Arrow Bus Services (GABS) <input type="checkbox"/> A Metrorail Western Cape station <input type="checkbox"/> Metered/Minibus taxis <input type="checkbox"/> Private transportation (Access to major roads, highways, and parking) <input type="checkbox"/> Healthcare <ul style="list-style-type: none"> <input type="checkbox"/> Emergency medical services <input type="checkbox"/> Clinics/General women's and men's health services <input type="checkbox"/> Child healthcare <input type="checkbox"/> Psychiatric care <input type="checkbox"/> Childcare <ul style="list-style-type: none"> <input type="checkbox"/> Preschool/Daycare <input type="checkbox"/> Education <ul style="list-style-type: none"> <input type="checkbox"/> General education public schools (Grades R - 9) <input type="checkbox"/> Private/International public schools <input type="checkbox"/> Universities <input type="checkbox"/> Technical Vocational Education and Training (TVET) colleges | <ul style="list-style-type: none"> <input type="checkbox"/> Essential Goods <ul style="list-style-type: none"> <input type="checkbox"/> Grocery stores <input type="checkbox"/> Clothing stores <input type="checkbox"/> Pharmacies <input type="checkbox"/> Home goods stores <input type="checkbox"/> Convenience stores <input type="checkbox"/> Petrol stations <input type="checkbox"/> Essential Services <ul style="list-style-type: none"> <input type="checkbox"/> Electricity <input type="checkbox"/> Waste management <input type="checkbox"/> Water supply <input type="checkbox"/> Sewage <input type="checkbox"/> Stormwater management <input type="checkbox"/> Sanitation <input type="checkbox"/> Information and Communication Technology (Wifi, towers, and antennae) <input type="checkbox"/> Safety and Security services <input type="checkbox"/> Financial and banking services <input type="checkbox"/> Opportunity for work |
|---|---|

FIGURE 1: ESSENTIAL SOCIAL AMENITIES CHECKLIST FOR PROPERTIES TO BE DEEMED FEASIBLE.

maintain a feasible financial scheme while providing maximum affordable housing units. On average we found that they include a ratio of $\frac{1}{3}$ subsidized housing units to $\frac{2}{3}$ open market units to remain financially feasible.

Finding 3: Ownership opportunities in housing schemes should appeal to residents

This desire has formed after years of living in the poor conditions of temporary and informal housing. Owning land provides housing security

that is not available in rental schemes where residents could more easily be evicted. This mindset often causes problems in alternative affordable housing developments, such as Social Housing projects, as they are not necessarily based on an ownership model.

Finding 4: Redefining new affordable housing projects encourages communities to accept and participate in them

There is a huge misconception about Social Housing and its benefits. A lack of understanding has caused the people of Cape Town to associate Social Housing with previous government relief efforts that were fully subsidized and poorly designed. The stigma surrounding social housing carries over to new affordable housing programs. Rebranding affordable housing and increasing advertisement could allow the program to accommodate more residents.

Finding 5: Better communication between stakeholder’s priorities will help align towards a common goal: more affordable housing

There are many individual and shared priorities that stakeholders hold regarding housing. The three main stakeholders we identified were civil society, public government, and private developers. Many of them align and interconnect with each other with a common goal for more affordable housing. The priorities of each group are outlined below in Figure 4.

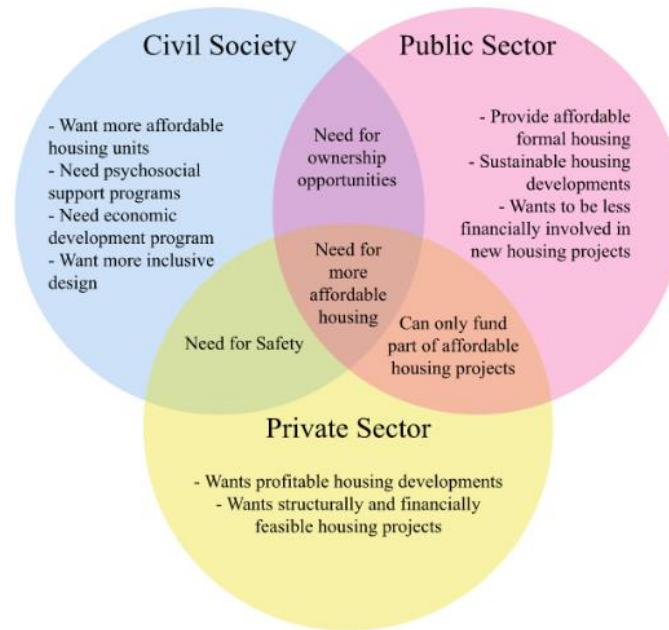


FIGURE 3: VENN DIAGRAM DEMONSTRATING DIFFERING PRIORITIES FROM MAJOR STAKEHOLDERS IN PROVIDING AFFORDABLE HOUSING.

Finding 6: Psychosocial support and economic development programs in affordable housing helps low-income residents gain independence

Many low-income residents carry trauma from their previous living situations and come from economically disadvantaged backgrounds. Providing counseling sessions in communal areas and wealth management courses such as budgeting, career development, and

setting up savings, would promote social and economic mobility and independence from government subsidies.

Finding 7: Promoting Safety Without Inhibiting Inclusivity can create more integrated communities

The construction of large, obtrusive walls blocks residents’ view of the surrounding community. This promotes exclusivity, thus dividing communities in the name of safety. This exclusivity separates communities from their surroundings which discourages a community focused approach to new housing projects. Therefore, promoting safety without inhibiting inclusivity can create more integrated communities.

Finding 8: An Inclusive Design model can bridge the gap between higher and lower income residents in the community

There is an immense need for promoting an inclusive design. A tenure blind design for apartment units and common areas would ensure an equal standard of quality despite the different amenities offered for open market and affordable housing options.

Finding 9: The lack of policy implementation can hinder inclusive housing design

The South African government, and more specifically, the government of the City of Cape Town, have already approved many inclusive policies regarding affordable housing. Upon researching policy documents and interviewing experts, we have determined there is a lack of implementation of existing inclusive policies in housing developments. Explicitly defining expectations for affordable housing units, and prioritizing developing new projects in the Central Business District would help ensure more inclusive policies are being implemented and considered.

Proposed Guidelines for a Transformative Housing Model: A Village All-in-One

Using all the findings and through discussions with the project sponsor, we put together a comprehensive document called “Proposed Guidelines for a Transformative Housing Model.” These guidelines are a consolidation of key processes and considerations to successfully transform appropriate

vacant or underutilized buildings into sustainable and integrated mixed use housing models. These transformative developments would aim to not only transform unused buildings, but also transform communities into more integrated spaces.

Proposed Guidelines for a Transformative Housing Model

A Village All-in-One



Prepared for:
Human Settlements Directorate
City of Cape Town, SA

14 December 2022

IMAGE 2: SCREENSHOT OF THE TITLE PAGE FOR THE “PROPOSED GUIDELINES FOR A TRANSFORMATIVE HOUSING MODEL”

The proposal guidelines explain the purpose, justifies the need of a transformative model, outlines the key findings used in its development, and details proposed considerations in 7 key areas as summarized below.

Social considerations:

This section outlines the four main considerations regarding the social aspect of this project. The first is the importance of partnering with NGOs for the development of a model such as the THM. These partnerships are crucial to ensure all residents’ needs are being met in an equitable way. The second consideration is the importance of implementing different financial schemes within the model to accommodate for the fluctuations in the economy. In doing this, residents are able to maintain their position in the building. The third consideration is ensuring all residents have equal access to the provided social amenities. This would ensure that social integration is promoted and upheld in this model. The final consideration is ensuring psychosocial support and financial development programs are truly implemented in the building. This would promote a greater sense of community and belonging in the residents.

Locational considerations:

This section outlines the importance of developing a housing project in an optimal location. This would entail proximity to social amenities such as healthcare, education, childcare, utilities, and other resources. If a site does not offer these amenities in proximity, it should not be considered for development. The main goal of this consideration is to promote densification. The exception to this is if a site is well connected, meaning it is near arterial routes, which would allow residents to have access to transportation to access such amenities.

Legislative considerations:

This section outlines all the legal processes that should be followed for a more efficient, inclusive, and sustainable housing development. This section also outlines the guiding principles that must be followed in developing housing projects. All of this makes up the legislative framework that must be followed to create sustainable Transformative Housing Model developments. Some of the documents referenced in this section

are the Spatial Planning and Land Use Management Act 16 of 2013 (SPLUMA) principles and checklist retrieved from the Department of Human Settlements Planning Directorate; the Municipal Spatial Development Framework (MSDF); and the Human Settlement Plans (HSPs).

Structural considerations:

This section outlines all the requirements a building should have to be deemed feasible for repurposing into a Transformative Housing Model development. It is likely that rezoning of the land for a THM development will be necessary and doing so would be feasible through the proper rezoning application process. This section also outlines the need for different surveys to determine the structural feasibility of retrofitting an underutilized commercial or industrial building into housing. The National Building Regulations and Building Standards Act No. 103 of 1977 provides all information on how to assess whether a given building is feasible for retrofitting into housing and should be followed thoroughly.

Smart technology enhancements:

This section outlines the need to follow the Integrated Human Settlements Sector Plan (IHSP), when implementing smart technology to follow the City of Cape Town's plan of achieving carbon neutrality by the year 2030. The section also outlines the benefits of implementing Alternative Building Materials and Systems (ABMS) in housing developments, in order to promote financial and environmental sustainability. This section concludes with the importance of informing the South African population on the benefits of ABMS, due to the stigma and stereotypes that are associated with materials that are not brick and mortar.

Financial considerations:

When determining the financial feasibility of a project there are two questions that need to be answered; how much will it cost and who will pay for it? This section begins with an analysis of potential development costs of the THM. This provides a ballpark cost estimate based on previous affordable housing projects. Next, this

section outlines potential investors and funding schemes. This section discusses revenue streams and important concerns with financing the THM. We estimated the cost to develop the THM and it is expected to fall within the range of R17,661.50 to R19,756.50 per square meter.

Marketing/ advertisement considerations:

This section outlines the importance of applying the proper advertisement and marketing strategies to appeal to each stakeholder. As demonstrated in Figure 14 of this document, each group prioritizes different aspects of housing opportunities. Below is a diagram, demonstrating what each advertisement should focus on to appeal to these different groups.

This section concludes with mentioning the importance of acknowledging the history surrounding housing in South Africa. When marketing to all stakeholders it is crucial to reiterate how the THM aims to give low to mid-income residents ‘a place’ in that area, rather than further promote gentrification.

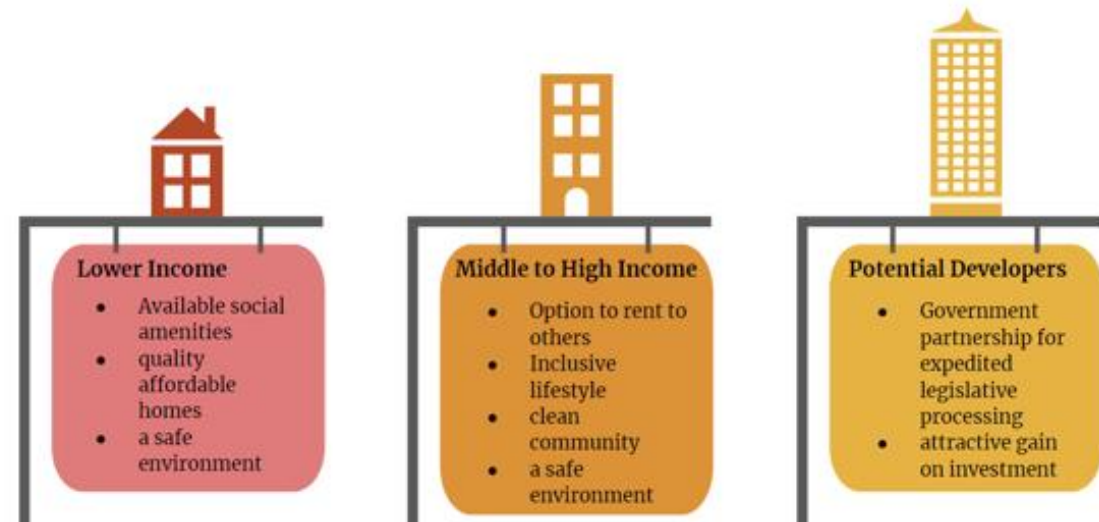


FIGURE 4: DIAGRAM DEMONSTRATING MAIN MARKETING FOCUSES ACCORDING TO EACH TARGETED GROUP.

Conclusion and Recommendations

The demand for affordable housing in Cape Town keeps growing while the Human Settlement Directorate (HSD) struggles to maintain fully subsidized housing programs. The proposal for the Transformative Housing Model has the potential to redesign social and government subsidized housing. This model gives an outline for how the HSD should address the housing crisis by creating economically and socially self-sustainable buildings, independent of continual maintenance from HSD

and initial private investors. Affordable housing remains an issue in large scale problems of inequity, further steps will need to be taken independent of this proposal. We recommend that the Human Settlement Directorate follow an iterative revision process. This would include strategic steps such as proposing the THM to key stakeholders to receive feedback and testing the THM via pilot programs. Steps forward taken in this direction by the Human Settlement Directorate can start fulfilling the ever-increasing demand for housing.

Acknowledgments

The Housing Team would like to acknowledge the contributions and advice from the engineers and urban planners, as well as NGO representatives interviewed, along with our sponsor Duke Gumede and advisors Thidinaleni Tshiguvho and Gbetonmasse Somasse.

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Authorship

IL = Isabelle Lachaux LN = Lorena Nunes JO = James Obermaier SO = Samuel Ott

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Chapter 1: Introduction

Remnants of social and civil unrest remain in Cape Town despite nearly three decades passing since the end of the apartheid era in South Africa. The city still faces many challenges, one of the most prominent being the housing crisis. The “Apartheid City” housing framework established segregated sections of the city, which has led to areas of economic and social disparity. This has given disenfranchised groups a significant lack of opportunity for social mobility and the housing supply deficit continues to increase.

According to recent household income statistics in 2020, 76% of households qualify for some form of government housing subsidy (City of Cape Town, 2022, p. 21-22). Previous government relief efforts have been unsuccessful in meeting housing demands in an economically and environmentally sustainable way. Historically efforts have been engineering centered, focusing on providing a structure without accounting for cultural, political, or environmental considerations of the area. Housing, in this respect, was seen as “machines” and was built to be “mono-functional” and “environmentally sterile”. This lack of human-centered design created unwanted housing, which only placed further dissatisfaction and burden on the residents and the city (CSIR, 2000).

The challenge now is the creative development of mixed-program housing projects. New housing projects must account for community feedback, governmental regulations, and financial considerations. These mixed-use buildings would include not only residential spaces but businesses as well. Ideally, these buildings will address the need for housing, provide new locations for greater economic opportunity and social mobility, and aid in the deconstruction of the “Apartheid City” framework. One promising option to further these projects is to take advantage of the many commercial buildings and factories in Cape Town that have been abandoned. This plan could facilitate the development of smart, sustainable, and functional housing to meet demand by using the abundant supply of empty buildings.

The goal of this project was to develop a mixed-program housing model for the repurposing of underutilized commercial and industrial properties into “transformative housing developments.” To meet our goal, we identified 3 objectives: 1) Identify the elements of transformative housing by examining mixed program models implemented in the past, 2) Determine stakeholders' perspectives and preferences on repurposing properties into transformative housing properties, and 3) Develop a model for the repurposing of industrial and commercial buildings into Transformative housing properties. This project goal would contribute towards mitigating a significant crisis for unhoused residents, promote a mixed-use framework for future land development, and advocate for amending inequitable housing conditions left from the “Apartheid City” era.

Moving forward it is important to think about how our project will benefit Cape Town. What are the lasting effects we hope to leave at our project site? Our project follows the UN Sustainable Development Goals 9 and 11. The sustainable goal 9 refers to “building resilient infrastructure, promoting inclusive industrialization and fostering innovation” (UN Department of Economic and Social Affairs, n.d.). Our project falls into this category in fostering innovation by repurposing commercial and industrial buildings into smarter housing. We will also be

proposing building resilient infrastructure (if needed), using the materials readily available in Cape Town. And finally, our project focuses more on goal 11 which is “Making cities and human settlements inclusive, safe, resilient, and sustainable” (UN Department of Economic and Social Affairs, n.d.). The lasting effects we hope our project will have is promoting urbanization by bringing more people into active urban nodes through more formal housing opportunities. We hope our proposal will serve as a model for future repurposing projects that may happen in Cape Town.

Chapter 2: An Overview of Housing Challenges in the City of Cape Town

In this chapter, we discuss Cape Town's severe housing shortage and the pressure on the city government to find a sustainable and low-cost housing development plan. We begin with a general overview of the problem the city is facing, followed by an explanation of the City of Cape Town's objectives for addressing this housing problem. We will introduce the current Social Housing Model and analyze the successes and concerns with it. Finally, we conclude by stating our proposal to move forward with a new alternative housing model for Cape Town.

2.1 Understanding the Complexity of the Housing Crisis in Cape Town

Cape Town's housing demands are greatly disproportionate to the available housing and resources provided by the city's municipality. Around 76% of the population of Cape Town is eligible for government-subsidized housing in some way (City of Cape Town, 2022, p. 23). According to the 'City of Cape Town's Integrated Human Settlement Sector Plan' (City of Cape Town, 2022, p. 34), from 2013 to 2018, there was a 13% increase in housing demand compared to the minimal 5% increase in housing availability. The Development Action Group estimates as of 2020, 2.6 million citizens of Cape Town are waiting for housing (DAG representative, personal communication, November 11, 2022). This deficit in the housing supply is only one element of the larger issue.

During the apartheid era, Colored, Black, Asian, and Indian groups were forced out of the inner cities as shown in Image 3 below. These groups, once removed from their homes, were forced to establish informal settlements along the peripheries of the city. This social segregation created economic and cultural discrepancies, and as a result, non-white groups want to reclaim taken land and move back into the inner city. However, the lack of affordable housing has hindered their ability to move closer to economic hubs and resulted in the establishment of informal settlements across the city. A prime example is District 6 in Cape Town, where current projects face resistance due to the history of forced evictions and gentrification (Architect, personal communication, October 31, 2022). The Human Settlement Directorate and Cape Town's Government have attempted to solve the housing crisis by providing a range of subsidized formal housing for residents in informal settlements. Forced displacement of low-income groups created urban sprawl, putting strain on resources and infrastructure available to settlements further from the economic center of the city (NASHO representative, personal communication, November 3, 2022).

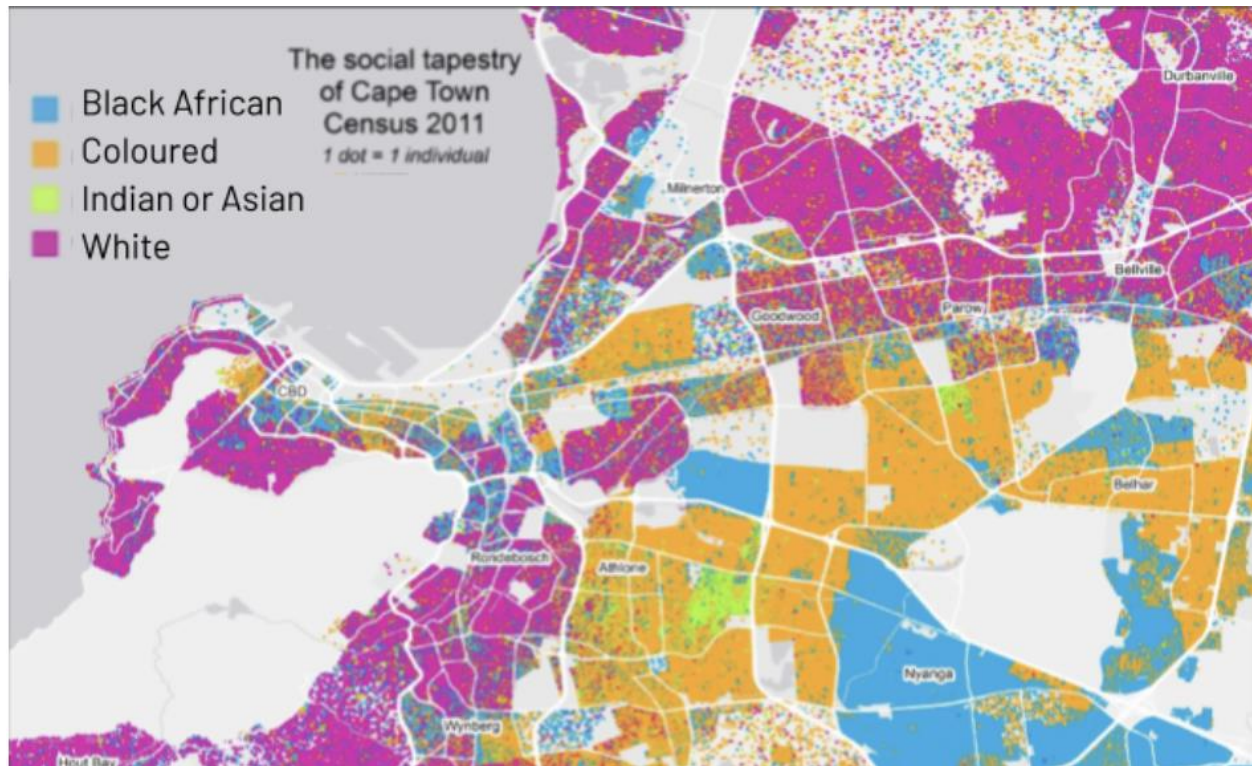


IMAGE 3: IMAGE SHOWING THE RACIAL DISTRIBUTION OF RESIDENTS ACROSS CAPE TOWN FROM THE DEPARTMENT OF STATISTICS (DEPARTMENT OF STATISTICS REPUBLIC OF SOUTH AFRICA, 2016)

The City of Cape Town (CCT) government now struggles to front the growing costs of completely subsidized housing schemes, such as Breaking New Ground (BNG). BNG is a free housing scheme offered to the lowest income bracket (R0 to R3,500). Transitioning to partially subsidized housing schemes, such as high-density Social Housing, will promote densification and economic mobility of residents. Utilizing existing city infrastructure to densify will also further reduce costs for development (Middleton, 2018b). Social Housing is a partially subsidized rental housing scheme for a wider income bracket (R1,850 to R22,000). Social housing, however, has been hindered in its delivery by public perception. Its effectiveness is commonly misunderstood due to its affiliations with poor government-subsidized housing. Potential residents often resist the high-density housing options due to a cultural desire for ownership rather than an apartment lease under a Sectional Title Ownership Act (DAG representative, personal communication, November 11, 2022). This led to a cultural demand for ownership of housing, creating income-poor but asset-rich communities enforcing the cycle of homelessness when residents sell off formal housing for money (NASHO representative, personal communication, November 3, 2022).

Given the demand for free housing provided by the government, “the pressure is on to find practical ways to massively increase the scale and pace of quality, well-developed, affordable housing implementation in desirable urban locations” (Middleton, 2018c). The Human Settlement Directorate is exploring new opportunities for developing a sustainable model to convert commercial and industrial buildings into smarter housing settlements in Cape Town.

2.2 Housing Objectives for The City of Cape Town

Section 26 of the Bill of Rights included in The Constitution of the Republic of South Africa 1995 states, “Everyone has the right to have access to adequate housing [...] The state must take reasonable legislative and other measures, within its available resources, to achieve the progressive realization of this right.” It is, therefore, the City of Cape Town’s responsibility to not only provide housing to all citizens but to ensure that housing is “adequate.”

The Western Cape Government states in their Department of Human Settlements 2021/2022 annual report, “Creating integrated communities that are livable, safe and multi-opportunity remains a strategic focus for the Department of Human Settlements.” To help guide the state towards fulfilling the responsibility of “adequate housing” through this “strategic focus”, the City of Cape Town has devised sets of guiding principles to follow in providing new housing. These principles, if followed properly, should aid in the creation of a more integrated urban planning framework. Below are some of the objectives set out by the city government that new housing projects should aim to achieve:

“Promote the integration of the social, economic, institutional and physical aspects of land development; Promote the availability of residential and employment opportunities in close proximity to or integrated with each other; Promote a diverse combination of land uses, also at the level of individual erven or sub-divisions of land; Contribute to the correction of historically distorted spatial patterns of settlement in the Republic and to the optimum use of existing infrastructure; And encourage environmentally sustainable land development practices and processes.” (South Africa, 1995, as cited in CSIR, 2000)

These objectives represent a fundamental shift in the strategy taken by the City of Cape Town since BNG housing. This shift is mainly centered around the public sector’s investment in opportunity rather than subsidized structures. Their focus is now on using the government as a collaborator rather than a supplier of physical houses. This would mean building sustainable communities with involvement from private developers, commercial businesses, and the surrounding community. (Department of Human Settlements, 2019). Here the government entities and subsidies would only be a piece of the final integrated housing project.

5 Principles of Sustainable Neighbourhood Planning



Diagram. 8 The 5 principles of sustainable neighbourhood planning. UN-Habitat proposes an approach that summarizes and refines existing sustainable urban planning theories to help build a new and sustainable relationship between urban dwellers and urban space, and to increase the value of urban land. This approach is based on 5 principles that support the 3 key features of sustainable neighbourhoods and cities: compact, integrated, connected.

FIGURE 4: DIAGRAM SHOWING THE 5 PRINCIPLES OF SUSTAINABLE NEIGHBORHOOD PLANNING RETRIEVED FROM THE DEPARTMENT OF HUMAN SETTLEMENTS, 2019.

The above diagram detailing the principles of the new neighborhood framework described above is from the Guideline for the Preparation of Municipal Human Settlement Plans. It shows the need for social amenities and essential infrastructure, densification, and for multifunctional spaces in a diverse community. These principles are best summarized in the document stating the “3 key features of sustainable neighborhoods and cities: compact, integrated, connected” (Department of Human Settlements, 2019).

Through our research, our team has identified the Social Housing model as a good example of how these principles and objectives have been applied thus far.

2.3 Benefits of the Social Housing Model

The Social Housing Act was passed in 2008 with the intention of promoting better social, economic, and spatial integration of low to mid-income residents in urban centers. To realize this, “the Social Housing Program in South Africa delivers well-located, affordable rental accommodation for low to moderate income groups (qualifying households earn between R1,500 to R15,000 per month)” (Middleton, 2018a). Social housing projects are developed, owned, and managed by Social Housing Institutions (SHIs) and regulated by the Social Housing Regulatory Agency (SHRA) (Fester, 2022). Given its opportunity for economic mobility, Social Housing is becoming increasingly popular in South Africa. This is because the model provides access to essential amenities such as schools, healthcare, transport, and proximity to employers (Middleton, 2018b).

The model of social housing targets rental tenure over ownership for residents of various income ranges. In comparison to BNG schemes, the social housing model appears to be the most successful in promoting social integration thus far. Heather Maxwell, CEO of SOHCO, mentions, “it all comes down to people’s access being improved in terms of spatially being able to live in areas where pricing of the housing market would have excluded them” (Middleton, 2018a). Tenants have the obligation of paying a monthly rent to incentivize economic mobility

while still receiving government aid until they are able to achieve economic independence (NASHO representative, personal communication, November 3, 2022).

However, there are many “bottlenecks” regarding the implementation and regulation of social housing. All public and private developers must obey an extensive list of rules and work within the same schedule, which causes many obstacles in the construction and approval of housing projects (Architect, personal communication, October 31, 2022). In addition, there are many social “bottlenecks” involving the areas these buildings would be constructed in. Social housing projects aim to be in well-located areas of the city. Great examples are the Woodstock and Salt River market areas, which are closer to the city of Cape Town. However, these areas suffer from historical trauma that cannot be ignored when developing housing projects, given the lasting effects of Apartheid. Certain areas of Cape Town that remained diverse are currently undergoing gentrification due to the changes in the housing market and the regeneration of neighborhoods. As stated in the book *Cracking Spatial Apartheid*: “While urban regeneration is vital to the positive growth of the city, there is a general lack of understanding on how urban regeneration incentives reinforce spatial inequities and therefore hamper efforts to improve the socioeconomic conditions of the urban poor” (Middleton, 2018b). The model of social housing attempts to halt that phenomenon, as further explained in the book *A Pathway to Implementation*, how new affordable housing schemes must mitigate the gentrification of inner-city neighborhoods by not excluding the poor residents in these projects (Stone, 2018).

2.4 Mixed-Program Housing Model

The mixed program housing model envisioned by the HSD includes mixed-use, mixed-income, and mixed-tenure programs. This would mean having business and residential units in one building, all sold on a sectional title ownership framework. This framework is where sections of the property, designated units, are sold. The owners of all the units come together to vote on property matters and rules via various management structures. In this sense, the owners of units would be buying into the property, not just an individual unit. The residential units would aim to provide housing for low, middle, and high-income residents. This mixed-income approach integrates groups of different economic backgrounds into one residency. This scheme aims to cross-subsidize, using income streams from businesses and higher-income residents to aid lower-income residents’ rents. By moving closer to denser economic activity and having less of a monetary burden on housing, this scheme offers lower-income residents more economic opportunity and social mobility (D. Gumede, personal communication, November 7, 2022).

One of the biggest issues foreseen by the HSD in this model is funding. Following their objectives detailed in section 2.2, the City of Cape Town is relying heavily on a public/private sector partnership in realizing this model. This way, the lack of funding from the government for a project can be accounted for in private sector investment. The only caveat is now, mixed program projects would have to compete in the private sector (D. Gumede, personal communication, November 7, 2022). This is supported by the following statement, “If housing for the poor is to ‘compete’ with other more profitable land uses, the land must be much more intensely used, this means densification of settlements needs to be explored” (Mtantato, 2012, as cited in Western Cape Department of Human Settlements; Policy and Research Directorate,

2018). The HSD foresees this Mixed Program Model as a natural step forward from Social Housing schemes (D. Gumede, personal communication, November 7, 2022).

2.5 Next Steps Forward for Housing

Overall, the next steps forward for creating more integrated and sustainable communities rely on the densification and smarter use of land, better collaboration between the government, developers, and communities involved in new projects, and ensuring that new projects are well located (Middleton & Stone, 2018). It is important to note that these general steps are heavily reliant on the details of each project; “well located” might mean something different for each community, for example. This is a big reason why clear communication between all stakeholders is essential in understanding what is best for future residents in new projects (DAG representative, personal communication, November 11, 2022).

Chapter 3: Methodology

Our team worked alongside Cape Town’s Human Settlement Directorate to contribute to exploring potential solutions to the current housing shortage. The goal of this project was to develop a mixed-program housing model for the repurposing of underutilized commercial and industrial properties into “transformative housing developments.” To meet our goal, we focused on the following three objectives:

- Identify the elements of transformative housing by examining mixed program models implemented in the past.
- Determine through interviews stakeholders' perspectives and preferences on repurposing properties into transformative housing.
- Develop a model for the repurposing of industrial and commercial buildings into transformative housing properties.

3.1 Identify the elements of transformative housing by examining mixed program models implemented in the past

This objective aimed to better understand the processes necessary to begin development on new mixed-use housing projects. This encompassed everything from the initial idea to the approval for construction.

Our team worked with the City of Cape Town and various urban city planners employed by the HSD to analyze previous and ongoing housing projects. These were commercial buildings, industrial buildings, or vacant lots scheduled for repurposing into mixed-use social housing. Our team identified social housing projects as the closest model completed to a mixed program framework. For this reason, we investigated the successes and shortcomings of processes practiced in creating suitable social housing.

When analyzing documents and project proposals, we looked for common threads and outliers between the proposals and outcomes of similar housing projects. This helped us gain insight into which decision factors and design elements were important for the transformative housing model. We also interviewed engineers and members of HSD about the process and implementation of housing projects to better gauge the process of creating a proposal. This gave our team not only the requirements set out by the city, but also improvements from what was seen in the practice in the creation of relevant housing projects.

3.2 Determine through interviews, stakeholders' perspectives, and preferences on repurposing properties into transformative housing

Our team was interested in the perspectives of various stakeholders involved in this project. To accommodate the needs of potential residents, we interviewed NGO representatives, and technical specialists. The purpose of interviewing these specific groups was to identify the

essential social requirements as well as the physical feasibility of affordable housing projects. These experts provided insightful information due to their experiences with previous projects and expertise in their area of fieldwork. We interviewed experts from the following NGOs: National Association of Social Housing Organizations (NASHO), Ndifuna Ukwazi (NU), and Development Action Group (DAG). As well as engineers employed by the City of Cape Town's Housing Implementation Unit, of the Human Settlement Directorate, who have had experience developing social housing and government subsidized projects. We also interviewed a real estate agent in order to determine the best marketing strategies to advertise this new model, and a finance expert working for the National Housing Finance Corporation (NHFC) in order to determine the financial feasibility of developing the THM. A list containing all interviewees and the date of their interview is demonstrated in Table 1 in Appendix E.

Interviews were our preferred method of data collection as they allowed us to attain qualitative data conversationally. Using a semi-structured interview process, we were able to keep respondents on task with our questions while still allowing them the freedom to add additional information.

When interviewing, it was important that we positioned ourselves in a manner that did not imply we were leading but rather an amplifier of the respondents' voices. In the book *Researching the City: A Guide for Students*, it is further explained: "there is a risk that the power relations involved may limit rather than enable other voices to be heard" (Ward, 2020, p. 52). Our team proposed questions that minimized the risk of limiting their responses, thus preventing their experiences from being misunderstood. As the author also stated: "an interview is most valuable as a means of allowing and enabling people to discuss their own experience, their own position, and encouraging them to reflect on their understanding of it" (Ward, 2020, p. 52). Therefore, we learned from our respondents' experiences and implemented their perspectives in our proposal design.

We compiled general opinions from these interviews for the HSD. Interviews of NGO representatives and urban planners were all oriented to collect opinions on the necessities of a home and how to make those requirements feasible. Sample questions and scripts for each stakeholder are listed in the Appendices (see Appendix B-E). The qualitative data was interpreted and discussed in the Findings and Analysis chapter.

3.3 Develop a model for the repurposing of industrial and commercial buildings into Transformative Housing properties

This objective aimed to create guidelines for our recommended process for repurposing commercial and industrial properties into transformative housing developments. It was a consolidation of all processes and considerations that must be taken into account to successfully construct the mixed-use model development previously described. The processes and considerations were an accumulation of all research conducted through sections 3.1 and 3.2. The guidelines addressed factors such as the management structure of the building and essential property considerations and even outlined potential partners in this development. Overall, it emphasized the importance of a public-private partnership and how each party would benefit from this model.

The guidelines were developed to fast-track the development of a new kind of housing model that better aligns with the City of Cape Town's sustainability goals (See section 2.2). It would achieve this by providing the HSD with a foundation to propose the transformative housing model. By utilizing these guidelines, the HSD would have a concise overview of who should be involved in the creation of transformative housing developments, what each party's role would be in its creation and a general framework on how to engage with each party.

Chapter 4: Connectivity, Ownership, and Inclusivity; Key Findings on Affordable Housing

In this chapter, we present nine findings from our remote and in field research. These findings have been synthesized after analyzing documents to observe common trends and conducting interviews with various stakeholders described in Chapter 3. Our team will use these findings to guide our recommendations for the Transformative Housing Model.

Finding 1: Properties with high connectivity to the surrounding area are good targets for a transformative housing model

Basic social amenities should be accessible for all residents for a social housing project to be considered well-designed. These social infrastructures might include healthcare, education, childcare, grocery stores, banks and more. Reasonable walking distance to these social amenities is traditionally necessary for residents. However, we found that site connectivity to the surrounding area through major roads can make up for the lack of immediate access to social infrastructures. We analyzed two social housing proposal documents, one of which had traditional access and distance from neighborhood social amenities, while the other utilized connectivity to address the need for social amenities.

The first document analyzed was the Land Use Application for a site on Dillon Lane. Using the Geographic Information System (GIS) data, it was concluded that there is access to necessary social amenities in the immediate surrounding area as seen below in Images 4, 5, and 6 (Sustainable Planning Solution 2020). Dillon Lane is proposed to be built in an established residential area with facilities such as schools, childcare, hospitals, and places of worship.

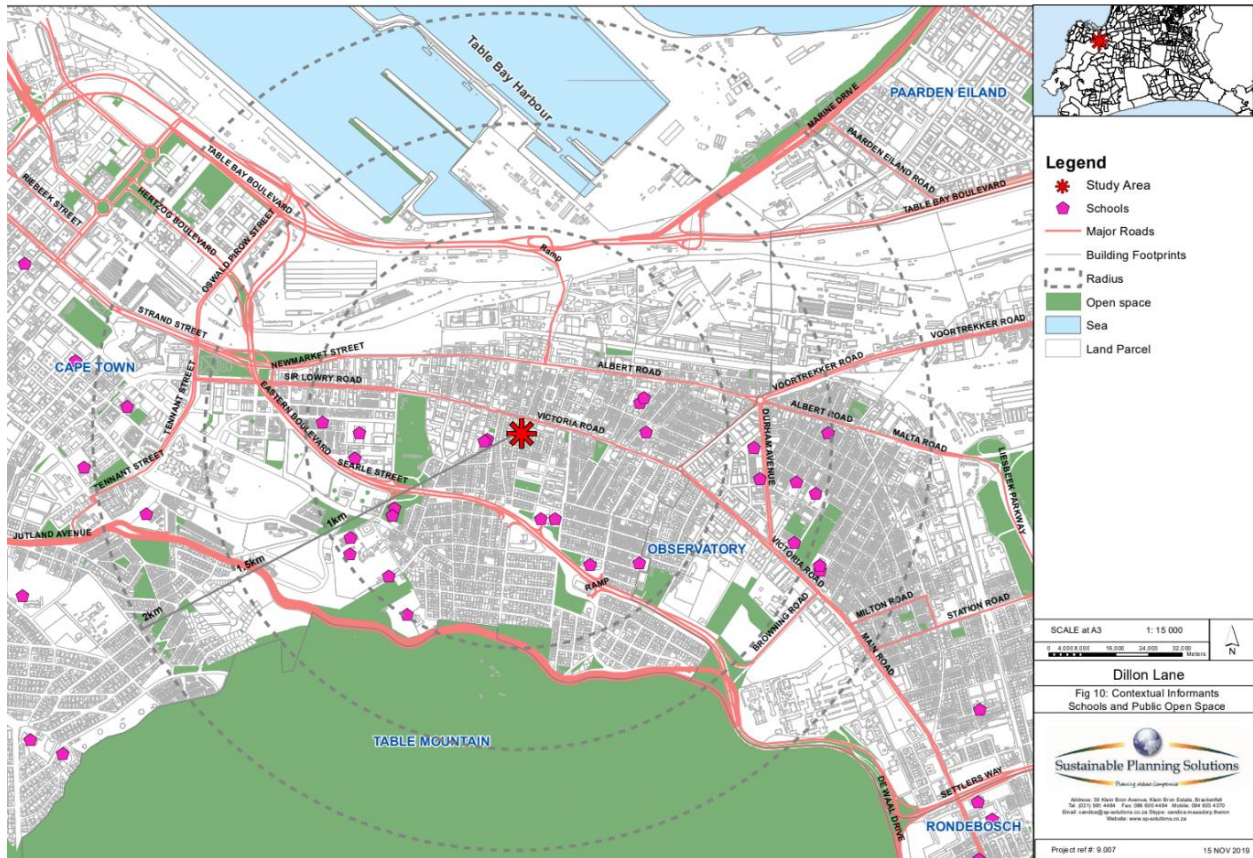


IMAGE 4: SCHOOLS IN THE SURROUNDING AREA OF DILLON LANE (SUSTAINABLE PLANNING SOLUTION 2020)



IMAGE 5: HEALTH CARE FACILITIES IN THE SURROUNDING AREA OF DILLON LANE (SUSTAINABLE PLANNING SOLUTION 2020)

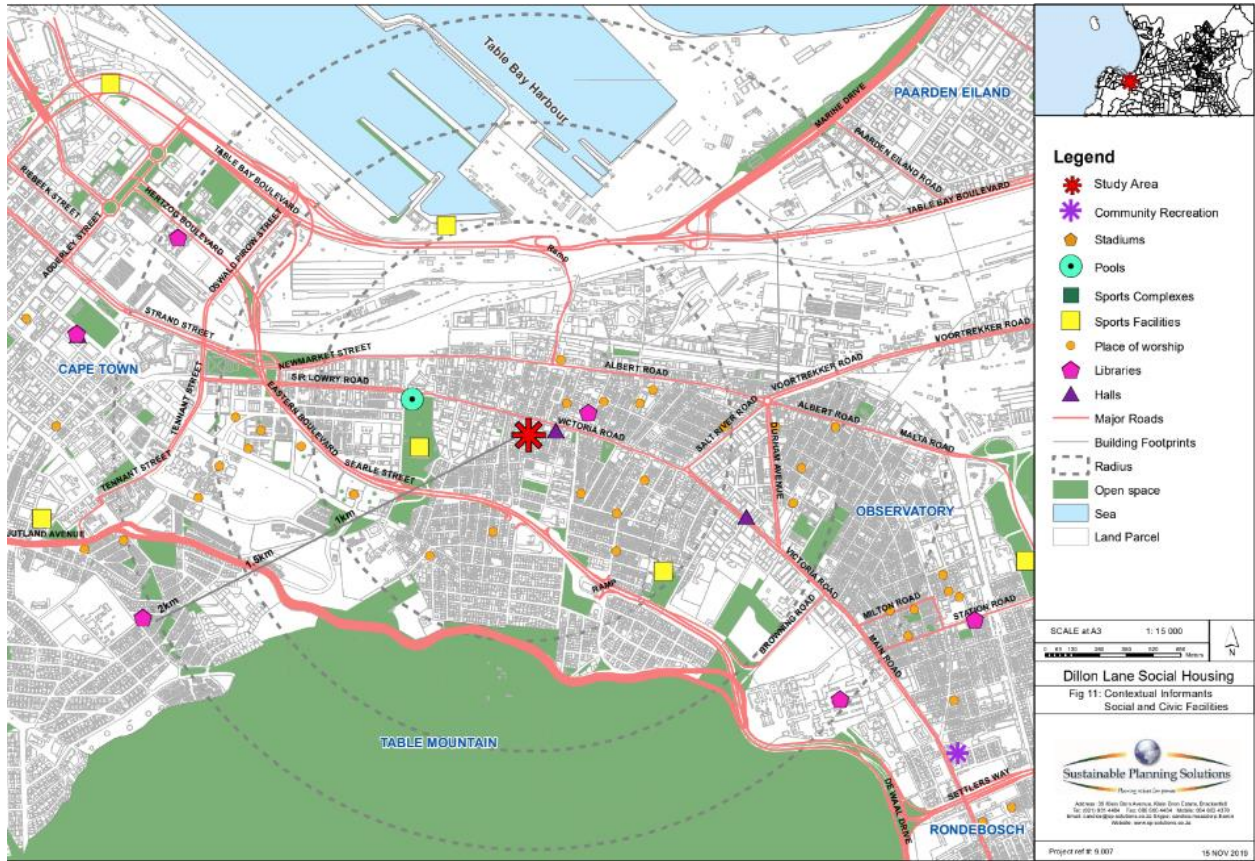


IMAGE 6: SOCIAL AND CIVIC FACILITIES IN THE SURROUNDING AREA OF DILLON LANE (SUSTAINABLE PLANNING SOLUTION 2020)

The second proposal analyzed was for a site called Pickwick, located in an area historically used for commercial and industrial zoning. This site lacks access to social infrastructure in the immediate area which would normally disqualify this site for housing development. As shown in Image 7 below, Pickwick is near childcare and schools but lacks proximity to other amenities like clinics or stores. (JSA Architects and Urban Designers, 2021). It became an acceptable site by counterbalancing the lack of social infrastructure with its closer proximity to major arterial roads which allows for public transport to necessary social amenities.

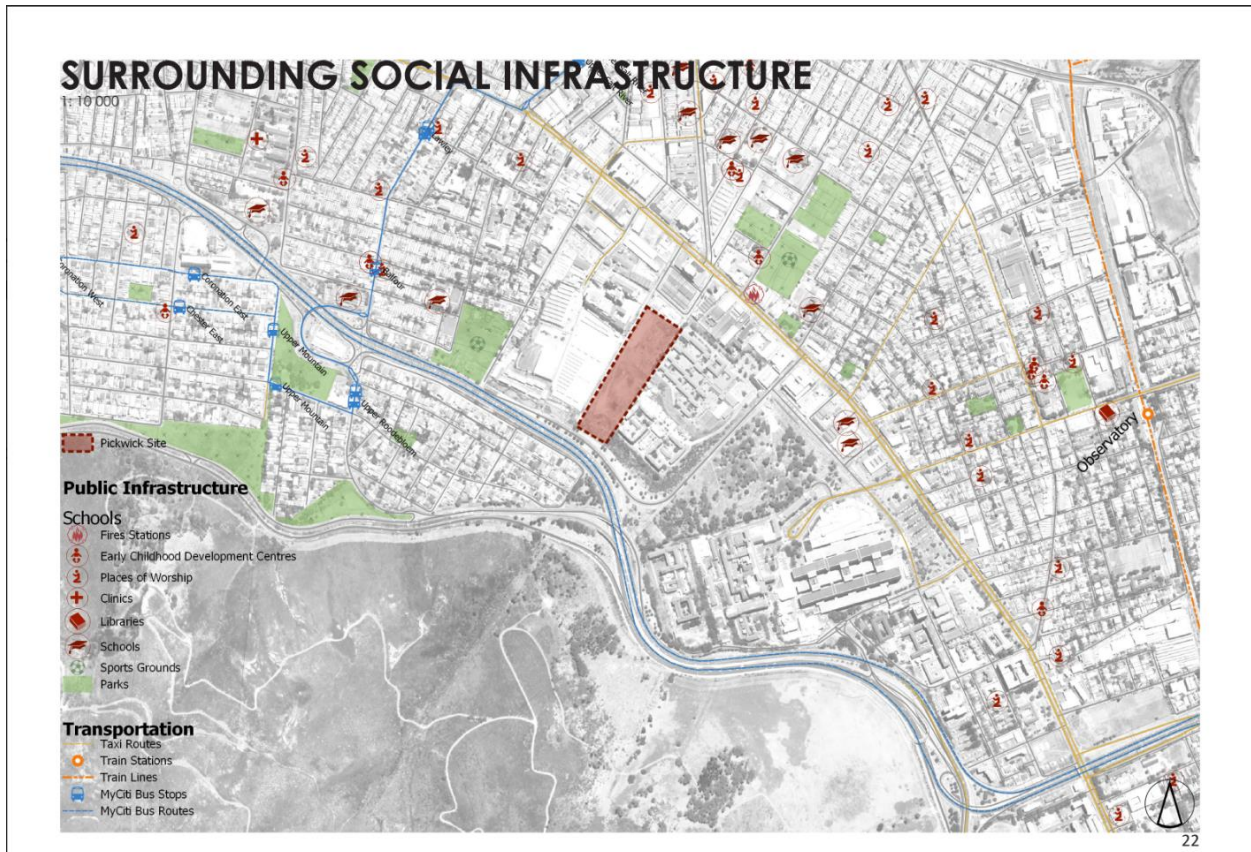


IMAGE 7: MAP OF PICKWICK SITE DEMONSTRATING SOCIAL INFRASTRUCTURE SURROUNDING THE SITE. (JSA ARCHITECTS AND URBAN DESIGNERS, 2021)

Consideration of properties with greater site connectivity with the surrounding area could expand the limits of ideal locations for housing developments. The main limit of this finding is that neither housing proposal goes into detail on what the ideal proximity social amenities should be from a development. These sites provide a good reference for what is considered acceptable in a site.

Finding 2: There is an optimal ratio of subsidized versus open-market housing units that can be provided in a development while still being financially feasible

Three multiprogram developments were analyzed, two of which have already been built and the third is proposed. The first development was the Belhar CBD Integrated Human Settlements Development. It is located in Cape Town and has a total of 4188 units, one-third of which are for government-subsidized housing and the other two-thirds are for the open market. The city government here is only fronting the cost of maintenance for the first year. After which, there will be a homeowner's association (HOA) that will be set up for the entire development. Since there will be multi-unit buildings, there will also be a body-corporate made of members from HOA. By doing this, the residents will be contributing to the maintenance of the development (Policy and Research Directorate, 2018). This relieves the government of a

financial burden through cross-subsidization. In this scheme, the government acts as a partner rather than a supervisor.



IMAGE 8: MAP OF BELHAR CBD INTEGRATED HUMAN SETTLEMENTS DEVELOPMENT (POLICY AND RESEARCH DIRECTORATE, 2018)

The second site examined was the Fleurhof Integrated Human Settlements Development which is in the city of Johannesburg in the Gauteng Province. The breakdown of units for the development is roughly 50% government-subsidized units and 50% open-market units. The city of Johannesburg currently pays for maintaining public spaces and is also in charge of the creation and maintenance of body corporates in this development (Policy and Research Directorate, 2018). This requires the government to operate more as a supervisor, having a greater long-term involvement and financial burden in the project.



IMAGE 9: FLEURHOF INTEGRATED HUMAN SETTLEMENTS DEVELOPMENT (POLICY AND RESEARCH DIRECTORATE, 2018)

The third example analyzed was a proposal for a development called Pickwick. This project reasons that having a government partner, rather than a supervisor, is more financially sustainable in the long term. It is in CCT and follows the one-third subsidized; two-thirds open market model described above. According to the Estimated Total Development Costs document provided by JSP Development Services, this ratio allows the open market units to remain competitive in value while effectively cross subsidizing the social housing units (JSP Development Services, 2021).

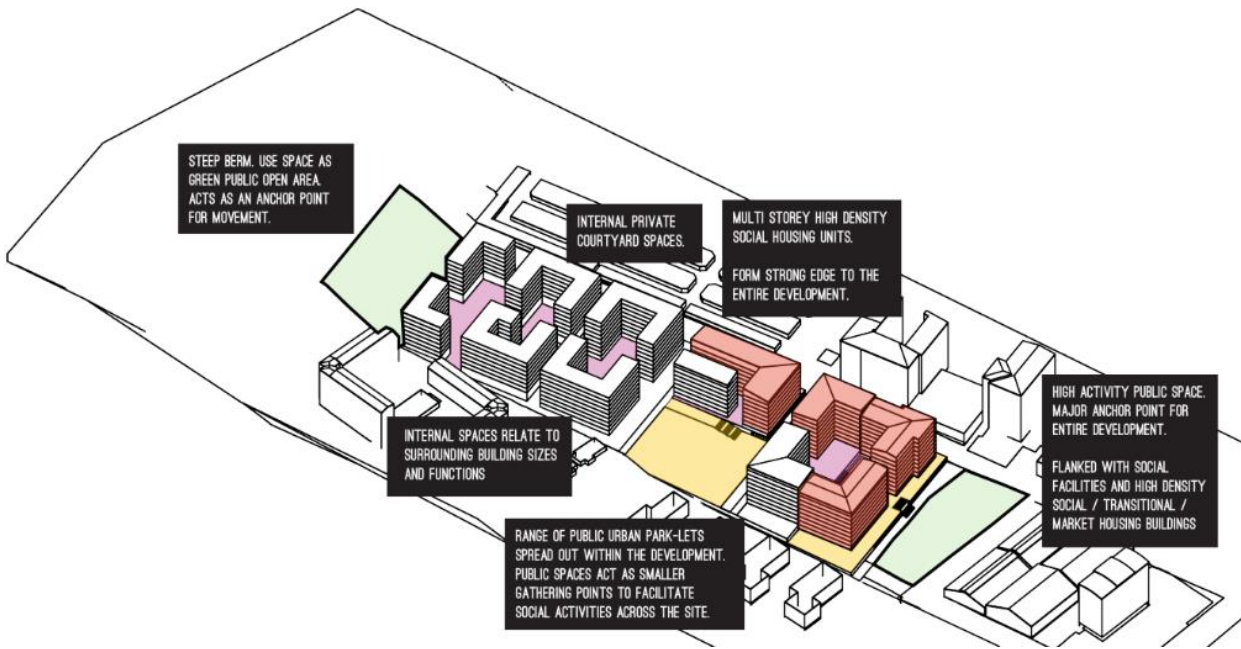


FIGURE 6: CONCEPT FOR BUILDING USAGE IN THE PICKWICK COMPLEX. (JSA ARCHITECTS AND URBAN DESIGNERS, 2021)

This could have implications for our project in determining the maximum number of social housing units while remaining financially feasible. In these statistics, it is important to keep in mind that units bought under the Finance Linked Individual Subsidy Program (FLISP) are included in the open market statistics above. This government subsidy is for first-time home buyers, so residents would still pay something out of pocket. Another thing to keep in mind is how little affordable housing has been made close to the CBD. This makes it difficult to confirm whether this ratio works in practice as we only can reference a few recent locations in Cape Town. Therefore, the $\frac{1}{3}$ - $\frac{2}{3}$ model is the most supported option right now, but as other projects develop the financial feasibility of this ratio can be revisited.

Finding 3: Ownership opportunities in housing schemes generate greater appeal in residents

According to the civil engineer we interviewed, there is an immense desire for ownership among the South African low-income population. This desire has formed after years of living in the poor conditions of temporary and informal housing. Owning land provides housing security that is not available in rental schemes where residents could more easily be evicted. The civil engineer continued by explaining, “Maybe they want to turn it into a business, or maybe they want to hold flats and meet demand, but they want to own part of the land” (Civil Engineer, personal communication, November 4, 2022).

The DAG (Development Action Group) representative we interviewed explains another desire for ownership stems from when Mandela came into power. He promised “a better life” which is a promise the city of Cape Town population still holds the government accountable to

(DAG Representative, personal communication, November 11, 2022). Since it was written in the South African constitution that “Everyone has the right to have access to adequate housing, ... The state must take reasonable legislative and other measures, within its available resources, to achieve the progressive realization of this right” (The Constitution of the Republic of South Africa, 1996). The DAG representative explained how this impacts society since older generations still believe they are entitled to own a free house by the government: “So, to this day, especially older generations, like, my mom and dad's generation, their mindset is still no, Mandela said free housing, you know, and so we must get free housing.” This mindset often causes problems in alternative affordable housing developments, such as Social Housing projects, as they are not necessarily based on an ownership model. Because of this, tenants often refuse to pay their rent (DAG Representative, personal communication, November 11, 2022).

Finding 4: Redefining new affordable housing projects encourages communities to accept and participate in them

There is a huge misconception about Social Housing and its benefits. Many low-income residents have not heard of Social Housing, have not learned about the opportunities offered, or are simply ignorant of the program's true function (DAG Representative, personal communication, November 11, 2022). The lack of understanding has caused the people of Cape Town to associate Social Housing with previous government relief efforts that were fully subsidized and poorly designed. This association is not accurate as NGOs and the Social Housing Regulatory Agency (SHRA) work to ensure the quality of regulations and standards for housing. Regardless, due to the lack of marketing, communities are less likely to accept and participate in social housing projects (DAG Representative, personal communication, November 11, 2022). The stigma that Social Housing projects are poorly located away from the CBD and are low quality units carries over to new affordable housing programs. Rebranding affordable housing and increasing advertisement could allow the program to accommodate more residents.

Finding 5: Better communication between stakeholder’s priorities will help align towards a common goal: more affordable housing

There are many individual and shared priorities that stakeholders hold regarding housing. The three main stakeholders we identified were civil society, public government, and private developers. The priority of civil society is to receive more affordable housing opportunities, more psychosocial and economic support programs provided within projects, as well as a more inclusive design. Meanwhile, the public sector focuses on providing more affordable housing in a sustainable manner while increasing financial independence from projects (Architect, personal communication, October 31, 2022). On the other hand, the private sector prioritizes structurally and financially feasible housing projects to maximize profit. Despite these differences in priorities, many of them align and interconnect with each other with a common goal for more affordable housing. However, when residents feel out of place in a development it can lead to great dissatisfaction (Civil Engineer, personal communication, November 4, 2022). Better communication among stakeholders, emphasizing their shared goal of creating sustainable and affordable housing, could help to overcome this challenge. The priorities of each group are outlined below in Figure 6.

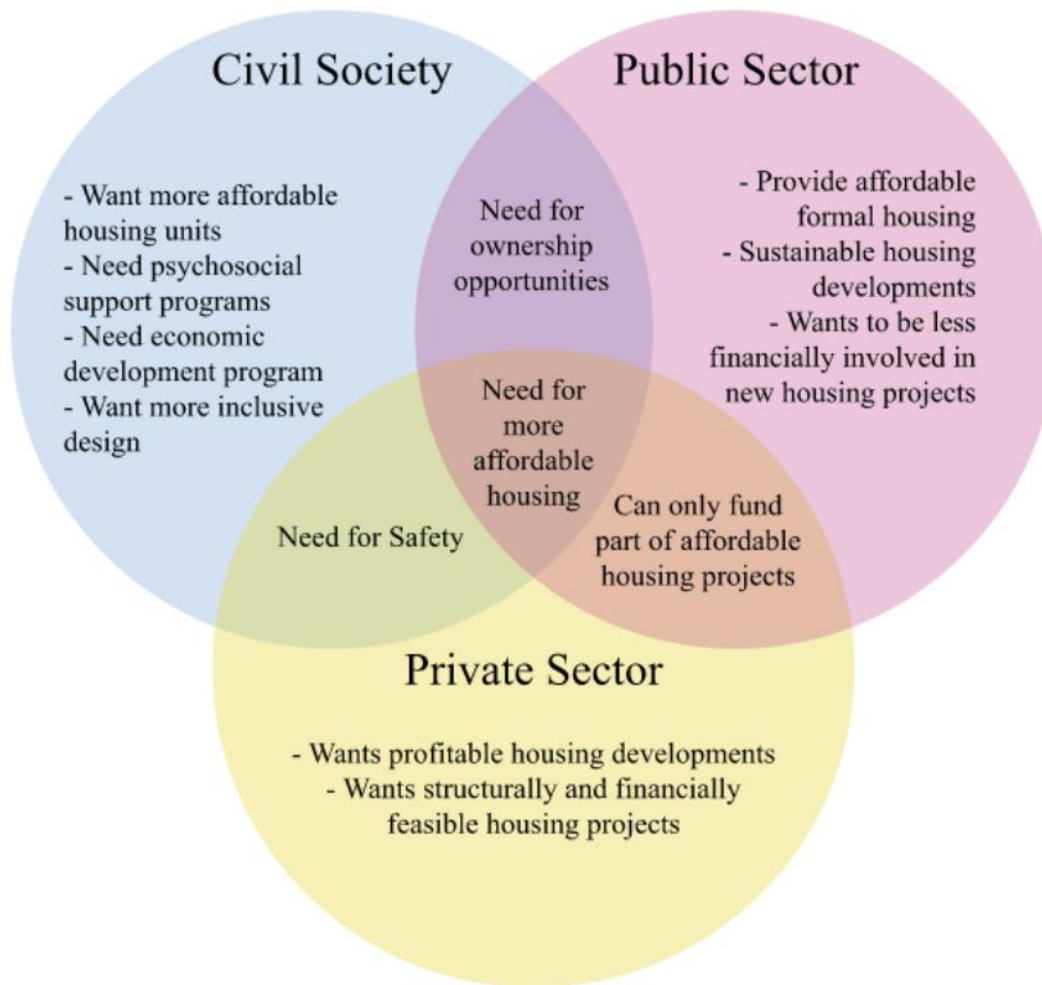


FIGURE 7: VENN DIAGRAM DEMONSTRATING DIFFERING PRIORITIES FROM MAJOR STAKEHOLDERS IN PROVIDING AFFORDABLE HOUSING.

Finding 6: Psychosocial support and economic development programs in affordable housing helps low-income residents gain independence

Upon talking to professionals our group found the importance of psychosocial support. Many low-income residents carry trauma from their previous living situations and need support to fully recover and, most importantly, have a sense of safety within the development (DAG Representative, personal communication, November 11, 2022). To promote psychosocial support, implementing rehabilitation programs would aid low-income residents that suffer from past trauma and harmful behaviors (DAG Representative, personal communication, November 11, 2022).

Additionally, teaching basic financial sustainability, such as budgeting, career development, and setting up savings, would promote economic mobility and independence from

government subsidies. (DAG Representative, personal communication, November 11, 2022). This concept was further supported by the NASHO urban planner when they stated that Social Housing is not just about the housing itself, but about the social integration to correct for segregation from the apartheid era (NASHO Urban Planner, personal communication, November 3, 2022). These psychosocial support and development programs would facilitate and boost that integration in a sustainable manner.

Finding 7: Promoting safety without inhibiting inclusivity can create more integrated communities

South African society views safety as the number one priority of housing developments, and that is often associated with high walls and electric fences (NASHO representative, personal communication, November 3, 2022). The construction of large, obtrusive walls blocks residents' view of the surrounding community. This promotes exclusivity, thus dividing communities in the name of safety. Ensuring safety in a housing project is key, however this exclusivity separates communities from their surroundings which discourages a community focused approach to new housing projects. (Architect, personal communication, October 31, 2022). Therefore, promoting safety without inhibiting inclusivity can create more integrated communities.

Finding 8: Inclusive design can bridge the gap between higher and lower income residents in the community

Upon further discussion with professionals, we also determined there is an immense need for quality common spaces for residents in these developments. These common spaces must contain amenities that all residents would make use of, such as laundry services, affordable clinics, pharmacies, and grocery stores. Most importantly, there should be a school nearby that kids from all different backgrounds have access to. These connections bridge the gap between higher and lower income residents, which allows for better connections between community groups (NU representative, personal communication, November 18, 2022).

Another form of promoting inclusivity would be designing the buildings to be “tenure blind.” This entails painting the buildings the same way and ensuring every apartment falls under the same quality standard despite the different amenities offered for open market and affordable housing options (NU representative, personal communication, November 18, 2022). An example of this is demonstrated in the feasibility study for the Pickwick site in the city center of Cape Town. This study showcases the standard structural and functional amenities that should be common throughout all types of apartments and buildings (JSP Development Services, 2021, p. 7). The differences can be seen in additional amenities within the open market and social housing apartments. Despite the difference in quantity, the quality of such should remain the same throughout all types of apartments (JSP Development Services, 2021, p.8).

Finding 9: The lack of policy implementation has hindered inclusive housing design

The South African government, and more specifically, the government of the City of Cape Town, have already approved many inclusive policies regarding affordable housing. Such clauses can be found in the CSIR Red Books vol. I and II (2000), the Municipal Spatial Development Framework (2022b), the Human Settlements Strategy (2021), and the Integrated Human Settlements Sector Plan (2022). These inclusive policies clearly state the quality, structural and locational standards a property must follow in order to be deemed successful according to the social and legislative aspects. However, many times developers (either public or private) fall short of ensuring all requirements stated in these policies are met in a housing development (NASHO representative, personal communication, November 3, 2022).

Previous relief efforts to account for the housing crisis in Cape Town have furthered urban sprawl. Many subsidized developments are in areas such as Greenfield, where the cost of development is much lower but further from the city center. This is an example of inclusive policies not being fully considered, given the location of these developments is not ideal and does not promote social integration. To account for this discrepancy, it would be beneficial for future affordable housing options to be developed in areas closer to the CBD. Despite the higher development costs, the proximity to essential social amenities encourages the social integration of lower-income groups (HSD representative, personal communication, December 5, 2022).

To account for the lack of implementation of inclusive policies, there is a need to explicitly define the expectations for affordable housing units, especially in mixed-income and mixed-tenure models such as the THM. This would establish that all-inclusive social policies are followed. It is crucial to also ensure developers follow all progressive policies so that equity is standardized and promoted throughout the entirety of the development (NU representative, personal communication, November 18, 2022).

Chapter 5: Proposed Guidelines for a Transformative Housing Model, A Village All-In-One

The main deliverable of the project is a document entitled “Proposed Guidelines for a Transformative Housing Model (THM)”. The proposed guidelines are a consolidation of key processes and considerations to successfully transform appropriate vacant buildings or properties into sustainable mixed-use housing projects. This document breaks down the THM by outlining its goal, who it affects, how to achieve this design, and why it is important. Social, legislative, locational, building structural, smart technology, financial, and marketing considerations will also be addressed and outlined thoroughly. Finally, potential strategic partnerships for developing a transformative housing model like a village all-in-one will be considered. The Proposed Guidelines for the THM emphasizes the importance of a public-private-partnership and how each party could contribute to and benefit from this model.

Proposed Guidelines for a Transformative Housing Model

A Village All-in-One



**Prepared for:
Human Settlements Directorate
City of Cape Town, SA**

14 December 2022

FIGURE 8: SCREENSHOT OF THE TITLE PAGE FOR THE “PROPOSED GUIDELINES FOR A TRANSFORMATIVE HOUSING MODEL.”

These guidelines were developed to provide the Human Settlement Directorate (HSD) with a foundation to propose a new housing scheme called the transformative housing model. Using these guidelines, the HSD could have a concise overview on who is involved in the creation of the Transformative Housing Model, what each party’s role is in its creation, and a general framework on how to engage with each party. These guidelines are meant to consolidate the key elements learned through documentation on previous affordable housing projects,

interviews conducted with stakeholders, and common threads noted through that research. The Proposed Guidelines for a Transformative Housing Model is included in Appendix G: *Proposed Guidelines for a Transformative Housing Model* below.

The guidelines begin with an introductory chapter. First is a paragraph on what the document is and how it should be used. This will serve as a concise introduction/abstract to the guidelines. Following this is the recommended management structure within a sectional title framework. This structure will provide the government and developers with an overview of the necessary institutions that must be formed, boards that must be appointed, and the roles of each entity within the complex. The next sections give an overview of the model itself. It begins with a brief explanation of the model, its goals, and the methods used to reach those goals. This is followed by the property management structure, stakeholder involvement breakdown, and an overview of the benefits seen from this model.

The next chapter of the document discusses the main considerations of the Transformative Housing Model (THM). The first is social and locational considerations. These sections will include feedback we've received from NGOs, architects, and engineers. Considerations include proximity to social amenities and arterial routes, the need for economic opportunity for lower-income residents, and possibly making asset and financial management courses for residents. These efforts aim to ensure the model targets economic mobility and spatial justice for disenfranchised groups. The next section covers all governmental considerations that must be taken into account. This includes, but is not limited to, how various spheres of government must interact with one another, the regulations and processes that must be included to realize this model, and general government spatial and housing goals. Next are the structural considerations. This section describes the physical assessments that must be completed to ensure the property is fit for reformation into formal housing. The next part of this section is about the financial considerations involved. This will aid in answering the following questions: How much will a project like this cost? And who will be paying for it? The last section discusses the importance of marketing this property and the potential partners that should be involved. Through our research, we've determined that this new property must have little association with previous government-sponsored housing programs. Ideally, the THM would be seen as new, green, safe, and affordable. Below is a summary of each consideration within the document.

Social considerations:

This section outlines the four main considerations regarding the social aspect of this project. The first is the importance of partnering with NGOs for the development of a model such as the THM. These partnerships are crucial to ensure all residents' needs are being met in an equitable way. The second consideration is the importance of implementing different financial schemes within the model to accommodate for the fluctuations in the economy. In doing this, residents are able to maintain their position in the building. The third consideration is ensuring all residents have equal access to the provided social amenities. This would ensure that social integration is promoted and upheld in this model. The final consideration is ensuring psychosocial support and financial development programs are truly implemented in the building. This would promote a greater sense of community and belonging in the residents.

Locational considerations:

This section outlines the importance of developing a housing project in an optimal location. This would entail proximity to social amenities such as healthcare, education, childcare, utilities, and other resources. If a site does not offer these amenities in proximity, it should not be considered for development. The main goal of this consideration is to promote densification. The exception to this is if a site is well connected, meaning it is near arterial routes, which would allow residents to have access to transportation to access such amenities.

Legislative considerations:

This section outlines all the legal processes that should be followed for a more efficient, inclusive, and sustainable housing development. This section also outlines the guiding principles that must be followed in developing housing projects. All of this makes up the legislative framework that must be followed to create sustainable Transformative Housing Model developments. Some of the documents referenced in this section are the Spatial Planning and Land Use Management Act 16 of 2013 (SPLUMA) principles and checklist retrieved from the Department of Human Settlements Planning Directorate; the Municipal Spatial Development Framework (MSDF); and the Human Settlement Plans (HSPs).

Structural considerations:

This section outlines all the requirements a building should have to be deemed feasible for repurposing into a Transformative Housing Model development. It is likely that rezoning of the land for a THM development will be necessary and doing so would be feasible through the proper rezoning application process. This section also outlines the need for different surveys to determine the structural feasibility of retrofitting an underutilized commercial or industrial building into housing. The National Building Regulations and Building Standards Act No. 103 of 1977 provides all information on how to assess whether a given building is feasible for retrofitting into housing and should be followed thoroughly.

Smart technology enhancements:

This section outlines the need to follow the Integrated Human Settlements Sector Plan (IHSP), when implementing smart technology to follow the City of Cape Town's plan of achieving carbon neutrality by the year 2030. The section also outlines the benefits of implementing Alternative Building Materials and Systems (ABMS) in housing developments, to promote financial and environmental sustainability. This section concludes with the importance of informing the South African population on the benefits of ABMS, due to the stigma and stereotypes that are associated with materials that are not brick and mortar.

Financial considerations:

When determining the financial feasibility of a project there are two questions that need to be answered; how much will it cost and who will pay for it? This section begins with an

analysis of potential development costs of the THM. This provides a ballpark cost estimate based on previous affordable housing projects. Next, this section outlines potential investors and funding schemes. This section discusses revenue streams and important concerns with financing the THM. We estimated the cost to develop the THM and it is expected to fall within the range of R17,661.50 to R19,756.50 per square meter.

Marketing / Advertisement considerations:

This section outlines the importance of applying the proper advertisement and marketing strategies to appeal to each stakeholder. As demonstrated in Figure 8 of this document, each group prioritizes different aspects of housing opportunities. Below is a diagram, demonstrating what each advertisement should focus on to appeal to these different groups.

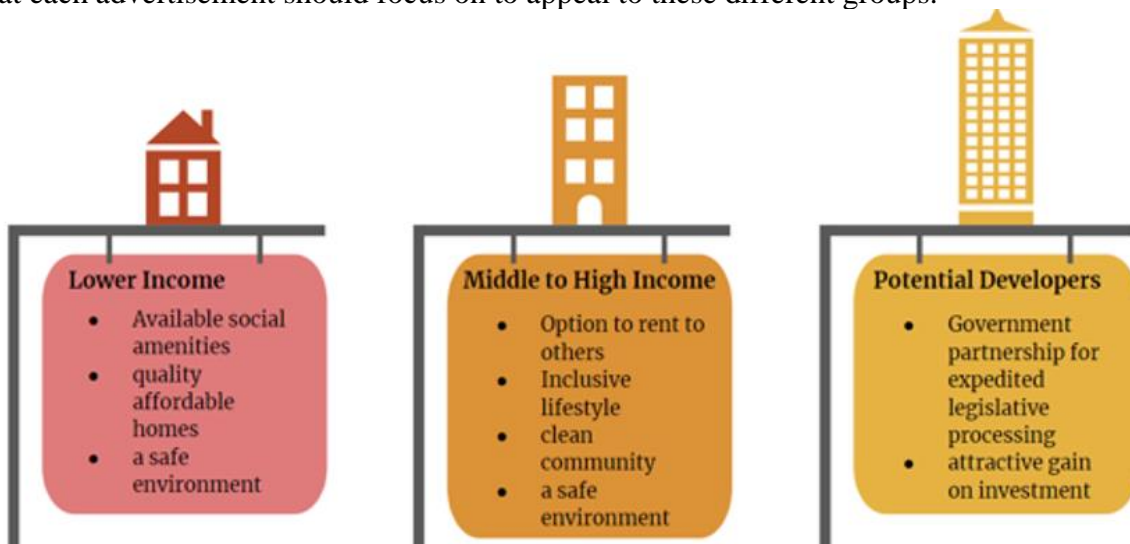


FIGURE 9: DIAGRAM DEMONSTRATING DIFFERENT MARKETING FOCUSES FOR EACH TARGETED GROUP.

This section concludes with mentioning the importance of acknowledging the history surrounding housing in South Africa. When marketing to all stakeholders it is crucial to reiterate how the THM aims to give low to mid-income residents ‘a place’ in that area, rather than further promote gentrification.

The deliverable document continues with a chapter of a simulated prototype of a THM development. This prototype includes the dimensions, capacity, features, and estimated costs of the project. This serves to provide an example of how all the considerations can come into play when designing transformative housing. Finally, the document concludes by describing its aim to be the start of a long process toward mending social disparities through housing.

Chapter 6: Conclusion and Recommendations

The demand for affordable housing in Cape Town keeps growing while the Human Settlement Directorate (HSD) struggles to maintain fully subsidized housing programs. Historically, government affordable housing has been described as “mono-functional” and “environmentally sterile.” The lack of human-centered designs created unwanted housing, which only placed further dissatisfaction and burden on the residents and on the city (CSIR, 2000). The HSD seeks to find new sustainable housing schemes for the residents of Cape Town. The challenge now is the creative development of new, innovative housing projects. These projects must account for community feedback, governmental regulations, and financial considerations.

The Transformative Housing Model (THM) that we propose has the potential to redesign affordable and government-subsidized housing. This model gives an outline for how the HSD should address the housing crisis by creating economically and socially self-sustainable buildings independent of continual maintenance from HSD and initial private investors. The Transformative Housing Model creates a self-sustainable community within one building, in other words: a village all-in-one. However, this addresses only one part of an intricate issue involving social inequities. Further steps will need to be taken by the HSD to minimize the gap between housing demand and availability.

We recommend that the proposed Transformative Housing Model be presented and discussed internally within the HSD to ensure that everyone at the HSD understands the THM and can provide feedback and suggest edits. This can be done by organizing meetings with each stakeholder group, presenting the THM, and soliciting their feedback. Once this process is complete, a pilot project can be tested and the THM can be refined based on the feedback from the participants. This iterative process will allow us to continuously improve the THM and ensure that it meets the needs of all key stakeholders.

Our research and findings aim to be the start of a long process toward mending social disparities through housing. Much work remains in finding a feasible alternative housing scheme that supports the City of Cape Town’s housing initiatives. With strategic steps towards realizing sustainable alternative housing schemes, the Human Settlement Directorate could move forward in fulfilling the ever-increasing demand for housing.

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Appendices

Appendix A: Glossary of Terms

DAG: Development Action Group
SHI: Social Housing Institutions
HSD: Human Settlement Directorate
BNG: Breaking New Ground
RDP: Reconstruction and Development Program
SOHCO: Non-Profit Social Housing Institution
CCT: City of Cape Town
FLISP: Finance Linked Individual Subsidy Program
CBD: Central Business District
NASHO: National Association of Social Housing Organizations
NU: Ndifuna Ukwazi
SHRA: Social Housing Regulatory Agency
NGO: Non-governmental organization
GIS: Geographic Information System
HOA: Homeowners Association
THM: Transformative Housing Model
CBD: Central Business District

Appendix B: Interview Questions for Financial Institutions

“We would now like to ask a few questions regarding mixed use housing and the financial aspect behind it. For clarification, our mixed-use housing model is defined as...”

Mixed use building definition: The building includes store front businesses on the ground floor. The floors above incorporate various housing schemes such as Social Housing, open market rental, and ownership. This allows residents from different economic backgrounds to reside in the same building. Our model focuses on a sectional title ownership framework.

1. In your words, what is the goal of your organization?
2. What is your role in your organization?
3. When a developer is given a loan, what is the timeframe/structure of paying it back?
4. What are some typical exit strategies of developers engaging in affordable housing projects?
5. How would we get a developer to stay with the project long term?
6. Hypothetically, how would we go about requesting funding or applying for funding for our model?
7. Would the *Affordable Housing Bridging Finance* program interfere with government funding/could there be a partnership of some sort?
8. In a sectional title framework how do owners typically pay for the title, is there a mortgage loan? All up front?
9. What is the best way to estimate the capital required to build this project? What about operational costs?

Appendix C: Interview Questions for NGOs

1. In your words, what is the goal of your organization?
2. What is your role in your organization?
3. What are your organization's "target" projects/causes?
4. What are some of the biggest bottlenecks you face in the process of finding and providing low-income housing?
5. Have you been involved in public and private sector partnership projects?
6. Do you think this mixed program model is feasible? Why or why not?
7. What do you think should be included in this model to cater towards low-income residents?
8. What has your organization done to encourage economic independence?
9. What incentives would drive your organization to partner in a project like this?

Appendix D: Interview Questions for Engineers and Architects

1. What are some previous housing projects you have been successful with?
2. What are some of your favorite projects you've worked on? Why?
3. What are some projects we can learn from? Why were they less successful?
4. Have you repurposed a property into housing similar to the scope of this project?
5. What are the advantages of repurposing a building rather than constructing a property from scratch (Cost, time, resource availability, security, etc.)?
6. Are there any new smart technologies that you think would be good to implement in new housing projects?
7. Are there elements of social housing projects that are often overlooked?
8. How do you think this has affected the well-being of residents living in those properties?
9. Do you think this mixed program model is feasible? Why or why not?

Appendix E: Interview Script and Table of Interview Participants

To ensure key stakeholders are aware of our project objectives and intentions, we will use the following introductory script to begin each interview. Preceding each interview, the Consent Form for Interview Participation (see Appendix G) will need to be signed by each interviewee.

For Appendix A (NHFC):

“Hello! We are a group of student researchers from Worcester Polytechnic Institute working with the Human Settlements Directorate. Our goal is to design a proposal for a multi-program building that combines the public and private development sectors. The multi program aspect will focus on mixed-income residents, mixed-tenure apartments, and mixed-use for businesses.

. We would like to take some of your time to ask five to ten questions regarding the financial aspect behind this whole process. Do you have the time to speak with us today? [Name] will now ask the interview questions.”

For Appendix B (NGOs):

“Hello! We are a group of American student researchers from Worcester Polytechnic Institute studying the housing crisis in Cape Town. Our goal is to create a plan that converts underutilized commercial and industrial buildings into mixed tenure housing to encourage urban growth. We would like to get some insight by asking you 10 or so questions about your experiences regarding a humanitarian approach to low-income housing. After our questions we would like to open the floor for you to add additional comments or concerns for this project. [Name] will now ask the interview questions.”

For Appendix C (Engineers and Architects):

“Hello! We are a group of student researchers from Worcester Polytechnic Institute working with the Human Settlements Directorate. Our goal is to create a plan that converts underutilized commercial and industrial buildings into mixed tenure housing to encourage urban growth. We would like to get some insight by asking you 12 or so questions about your experiences regarding the construction of public housing. After our questions we would like to open the floor for you to add additional comments or concerns for this project. [Name] will now ask the interview questions.”

Table 1- List of Interview Participants

Interviewee Occupation	Date of Interview
Architect	October 31, 2022
NASHO Representative/ Urban Planner	November 3, 2022
Civil Engineer	November 4, 2022
Duke Gumede, HSD Representative	November 7, 2022 and December 5, 2022
DAG Representative	November 11, 2022
NU Representative	November 18, 2022
Real Estate Agent (marketing expert)	November 29, 2022
NHFC Representative (finance expert)	November 29, 2022

* All interviewees have agreed to be cited within this document. No identifying factors were shown in order to maintain confidentiality. The only interviewee who was personally cited was Mr. Duke Gumede, the project sponsor, who has consented to being identified.

Appendix F: Consent Form for Interview Participation

Hello, we are a group of students from Worcester Polytechnic Institute (WPI) in the United States. We are participating in a project to assess the feasibility of repurposing commercial and industrial buildings into formal housing. These interviews will be used to understand the perspectives from different groups that would be involved in our project development plan. If you are willing to participate in this project, please read and note your preferences in this form. The results will be made public, and can be found in the following link: (WPI Projects link)

Your responses will NOT be used for identifying purposes. We will only use your response to collect data to conduct our research, no information will be drawn back to you personally. You may decline any of these if you do not feel comfortable participating. Do we have your permission to audio record this interview? Your voice will not be published, nor will your name. This recording is just so we can have a record of your response and will be deleted after the completion of this project.

Yes No

Will you allow us to use your words for use on our project proposal? We will not be identifying you when citing your response.

Yes No

Our project proposal will be published through our university and as a formal deliverable to the Human Settlements Directorate, do you consent to your response being recorded in our proposal? Your identifying information will not be published.

Yes No

I understand that these interviews will be published at WPI for educational purposes and made available to the public. My words from voice recordings may also be used in the published proposal, to amplify the perspectives of those who will be affected in some way through the implementation of more formal housing being built. My identifying information will NOT be published.

Sign: _____

Date: _____

Proposed Guidelines for a Transformative Housing Model

A Village All-in-One



WPI



human settlements

Department:
Human Settlements
REPUBLIC OF SOUTH AFRICA

**Prepared for:
Human Settlements Directorate
City of Cape Town, SA**

14 December 2022

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Acknowledgments

This document was developed by team composed of Isabelle Lachaux, Lorena Nunes, James Obermaier, and Samuel Ott, as part of a Worcester Polytechnic Institute's Interactive Qualifying Project in collaboration with the Human Settlement Directorate, City of Cape Town.

The team worked under the supervision of Mr. Duke Gumede from Human Settlement Directorate, City of Cape Town, and Professors Gbetonmasse Somasse and Thidinalei Tshiguwho of Worcester Polytechnic Institute

The Housing Team would like to acknowledge the contributions and advice from the engineers and urban planners, as well as NGO representatives interviewed.

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Introduction

The Proposed Guidelines for a Transformative Housing Model (THM) is a consolidation of key processes and considerations to successfully transform appropriate vacant buildings or properties into sustainable mixed-use housing projects. This document breaks down the THM by outlining its goal, who it affects, how to achieve this design, and why it is important. Social, legislative, locational, building structural, smart technology, financial, and marketing considerations will also be addressed and outlined thoroughly. Finally, potential strategic partnerships for developing a transformative housing model like “a village all-in-one” will be considered. The Proposed Guidelines for the THM emphasize the importance of a public-private-partnership and how each party could contribute to and benefit from this model.

These guidelines were developed to provide the Human Settlement Directorate (HSD) with a foundation to propose a new housing scheme called the transformative housing model. Using these guidelines, the HSD could have a concise overview on who is involved in the creation of the Transformative Housing Model, what each party’s role is in its creation, and a general framework on how to engage with each party. These guidelines are meant to consolidate the key elements learned through documentation on previous affordable housing projects, interviews conducted with stakeholders, and common threads noted through that research. More detail on the methodology used to conduct research can be found in Appendix A.

Chapter 1: Transformative Housing Model

This section is an overview addressing four main questions: what the THM is, how it is organized, who it affects, and the benefits of the model. The goal of the THM is to create an all-in-one inclusive design that incentivizes the sense of community amongst residents through common spaces and collaboration of different developers.

1.1 Explanation of Model

The Transformative Housing Model aims to create a self-sustainable community within a building; ‘a village-all-in-one.’ To do so, it must promote social integration and inclusivity through tenure blind design. This would mean apartments are built equitably and common spaces and social amenities would be accessible to all residents.

The THM approach envisioned by the Human Settlements Directorate (HSD) is novel in the sense that it includes the mixed use, mixed income, and mixed tenure programs. This would mean having business and residential units in one building all sold on a sectional title ownership framework. The residential units would aim to provide housing for low-, middle-, and high-income residents. This mixed income approach integrates groups of different economic backgrounds into one residency (HSD representative, personal communication, November 7, 2022). This scheme aims to cross-subsidize, using income streams from businesses and higher income residents to aid lower income residents’ rents.

In terms of the actual property, the THM would transform an underutilized industrial or commercial building into residential properties. By transforming an existing property, a larger value/cost ratio would be achieved due to the capitalization and leverage of existing amenities in the area (roads, electricity, stores, etc.). Additionally, being closer to denser economic activity and having less of a monetary burden on housing, this scheme offers lower income residents more economic opportunity and social mobility (HSD representative, personal communication, November 7, 2022). By incorporating different schemes and developers, a more collaborative and inclusive building design can be created. Through this, the Transformative Housing Model aims to not only transform buildings, but also the surrounding communities.

1.2 Property Management Structure

The Transformative Housing model follows a sectional title framework, as defined by the Sectional Titles Schemes Management Act of 2011. In this structure, a single development is split into units for sale. Those who have bought a sectional title for a single unit are partial owners of the entire development. These owners can either choose to find tenants to rent their units to or live there themselves. Once a stakeholder buys into this scheme and becomes an owner, they become a member of the body corporate. The body corporate is made up of all the owners and is responsible for voting on all property decisions including the management and

conduct rules. Upon completion of the project, the developer will act as a member of the body corporate for all units not yet sold. All management, conduct, and body corporate rules must align with those prescribed in the Sectional Titles Schemes Management Act of 2011 (Republic of South Africa, 2011).

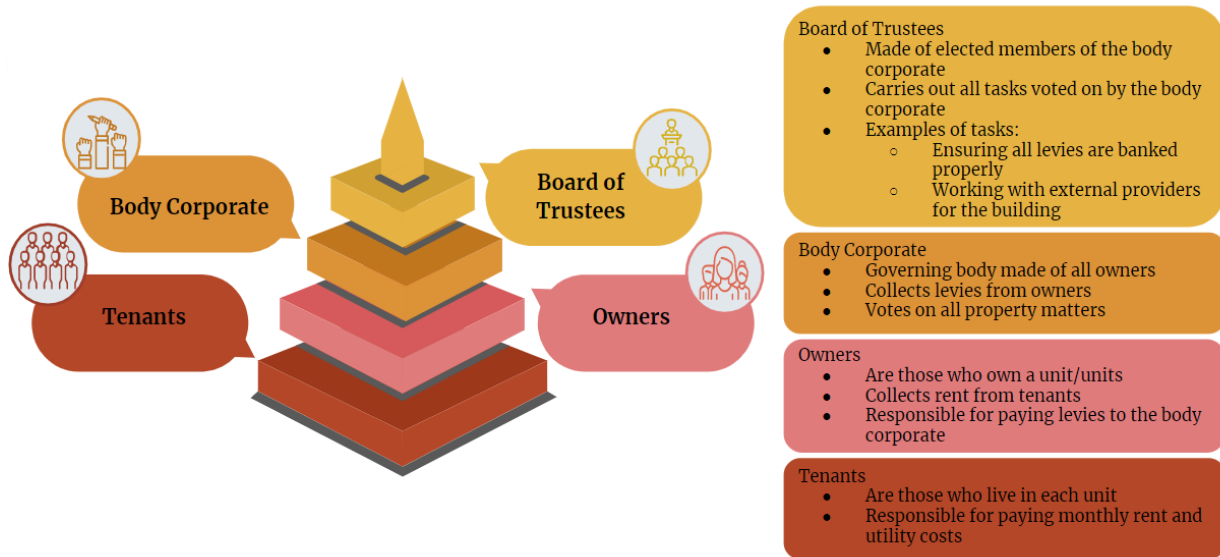


Figure 1: This diagram displays the hierarchy in terms of risk taken by each group involved in the sectional title scheme and their roles.

It is the role of the body corporate to establish a fund to pay for all agreed upon expenses which might include, but are not limited to, utilities, maintenance and upkeep, security, and insurance. Owners are prescribed payments in the form of levies to the body corporate to cover these expenses. This grants the owners access to these utilities and common areas as agreed upon by the body corporate (Republic of South Africa, 2011). In the envisioned framework, some examples of owners might be the City of Cape Town government, NGOs, low to middle income homeowners, and private investors.

It is also the role of the body corporate to elect a board of trustees. It is the trustee’s responsibility, on behalf of the body corporate, to manage and control the owners’ investments into the model. This could be anything from ensuring all levies are paid, banked, and used correctly to the hiring and management of cleaning, maintenance, and security providers. The trustees must act in accordance with the Sectional Titles Schemes Management Act No.8 of 2011. This means each trustee must act in the sole interest of the body corporate and “must avoid any material conflict between his or her own interests and those of the body corporate” (Republic of South Africa, 2011).

The sectional title framework is quite standard and can be seen throughout the Western Cape. This project introduces a novel focus on providing housing for low-income residents

within the same sectional title building as residents with a range of other economic backgrounds. To make this scheme economically and socially viable for these lower income residents, a variety of programs may be included to allow for greater economic mobility. Some examples could be allowing some residents to work for reduced rent options (“sweat equity”), implementing a rent to buy program, or having the government as a partial owner to ensure lower income residents have long term access to this housing.

1.3 Stakeholders

When breaking down the stakeholders involved in the THM, there are three main categories of beneficiaries: the private sector, the public sector, and the civil society. These groups would contribute in the development or maintenance of the property and in return receive certain benefits for their contribution. Within each broad category exist smaller subgroups, each of which contributes either labor, finances, feedback, or management. The private sector consists of private developers, financial institutions, and private owners. The public sector on the other hand consists of only the Cape Town Municipal Government and its relevant directorates and teams. Finally, the civil society category is made up of tenants, members of surrounding communities, and NGOs that represent the public. The figure below further breaks down the individual contributions of each group and their benefits.

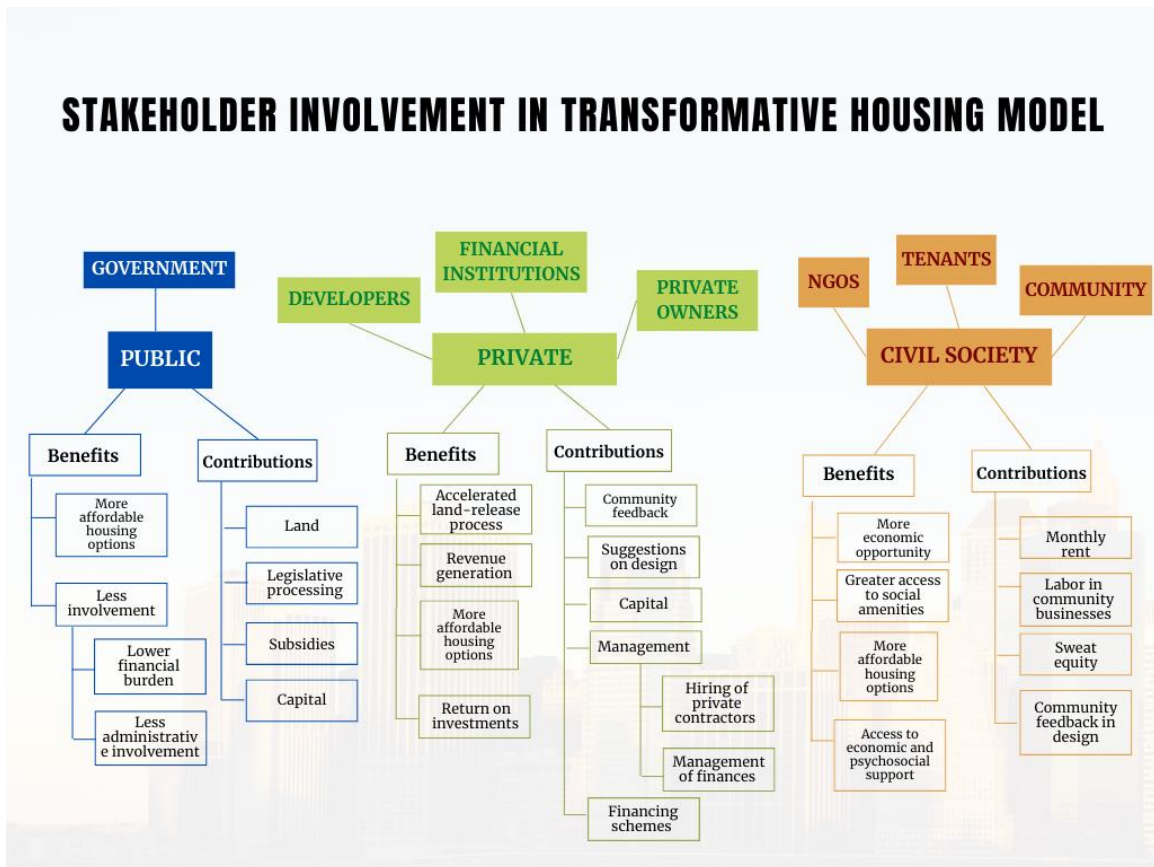


Figure 2: Diagram illustrating the contributions and benefits seen by each stakeholder's involvement in the THM.

A list of potential stakeholders is seen in Appendix B. The financial institutions and private developers would contribute and benefit from this collaboration model as demonstrated in the private sector section of the diagram. The NGOs would contribute and benefit according to the civil society section of the diagram.

1.4 Benefits of Transformative Housing Model

The Transformative Housing Model differentiates in nature in many ways from previous housing projects seen in Cape Town. The THM would incorporate all positive aspects from previous relief efforts and incorporate innovative strategies to improve the aspects that have not been proven to be successful. This model is beneficial to Cape Town because it provides an opportunity for a self-sustainable community, something that has not been completely accomplished beforehand. What differentiates the THM from other projects is that all benefits complement each other, thus creating a repeating cycle, as demonstrated in the figure below.

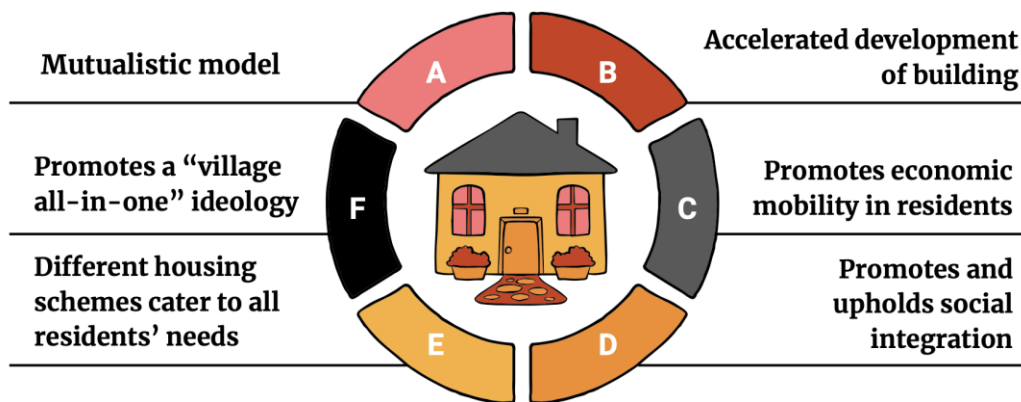


Figure 3: Diagram demonstrating the cycle of benefits the Transformative Housing Model provides.

The benefit of creating a mutualistic model is that through collaboration between different sectors, the needs of each stakeholder are catered to while still aiming to create a self-sustainable community. The specific benefits each stakeholder would gain are outlined in Figure 2, found in section 1.3. The second benefit mentions the accelerated development of this project due to the partnerships made between the public and private sector. The City of Cape Town has an immense demand for housing developments; therefore, collaboration of different entities would provide an accelerated supply to account for the ever-increasing demand. The third benefit is regarding the promotion of economic mobility in residents. Through the novel housing and financial schemes within this model, as well as the different development programs (both psychological and financial), economic growth is promoted within the residents. Consequently, this aids them in becoming more economically independent from the government. The more economically independent residents in this building become, the more revenue it generates, and

the less intervention from the government is needed. The sense of community within the building is also strengthened, given tenants can participate in this community for a longer period. The fourth benefit focuses on the fact that this model not only promotes but upholds social integration of lower income residents. Due to the tenure blind approach, the communal areas that are accessible to all, and the inclusive design of this model, the THM offers lower income residents a place in the system and a way for them to maintain their position. Promoting social integration is essential in reducing the disparities amongst the residents of different income groups and increasing the sense of community and belonging within all residents. The benefit of offering different housing schemes all within the same building, is that rental and ownership opportunities are both offered to account for all residents' needs considering the fluctuations in economy. This benefit reiterates the fact that the THM is offering residents the opportunity to maintain their position in the system. The final benefit is concerning the promotion of 'a village all-in-one' ideology. This benefit ties into all previous benefits. The social amenities that will be offered within the building are equally accessible to all residents and cater to all of their needs no matter their economic background. This allows for the creation of a self-sustainable community, which is a goal of this model.

Chapter 2: Main Considerations

This section consists of the main considerations that developers (either public or private) must follow to achieve a holistically successful transformative housing development. The main considerations in this section are as follows:

- Social
- Locational
- Legislative
- Structural
- Potential for smart enhancements
- Financial
- Marketing/ advertisement

2.1 Social Considerations

Cape Town still faces many challenges regarding lack of housing and social integration. The Transformative Housing Model (THM) aims to reduce these social disparities through sustainable housing. For this model to be successful, it is imperative for the government to make partnerships with groups that prioritize the needs of the people. Partnerships with NGOs are extremely beneficial due to the nature of their goals and supporting causes. NGOs such as Development Action Group (DAG) and Ndifuna Ukwazi (NU) have very different approaches but work to achieve the same goal: greater social integration and equitable opportunities for lower income groups, through advocating for higher quantity and better quality of affordable housing options. An example of the NGOs in action was the case of the Foreshore Freeway Project (Proposal C) in the Central Business District of Cape Town. In which affordable housing options were offered in the building, however there was an immense spatial inequity and disparity in comparison with the open market units, as demonstrated in the figure below. The NGO NU was the face of the ‘resistance’ against this proposal (Cogger, Park-Ross, 2022).

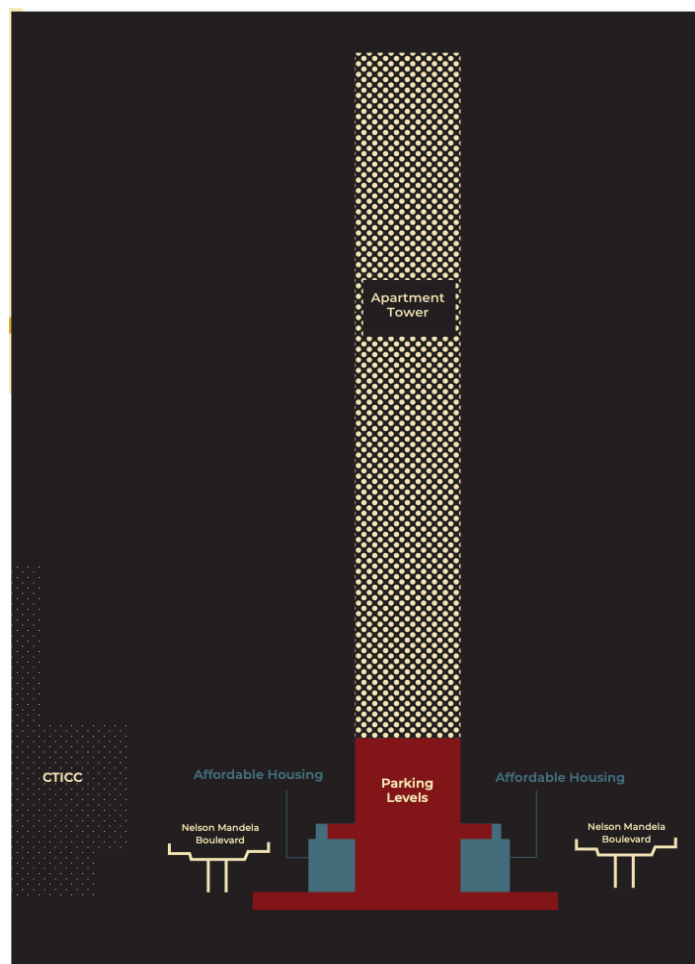


Figure 4: “Private sector proposal for the Foreshore Freeway project (Proposal C) where affordable housing (in blue) is only provided below the level of the freeway and mixed within the parking (red), while the market related housing (yellow) is provided above the parking and the freeway.” (Cogger, Park-Ross, 2022).

Another fundamental aspect that cannot be ignored is to incorporate financial schemes that accommodate for fluctuations in the economy, which affect most tenants. A huge problem Social Housing projects face is tenants struggling to keep a stable job/income due to these fluctuations in the market and irregularities with seasonal jobs (NU representative, personal communication, November 18, 2022). Difficulties keeping up with a steady rent often results in eviction. By implementing programs such as reduced rent through “sweat equity” or options where tenants can pay different amounts towards their rent according to their income, it would allow for people to have a better opportunity at maintaining their position in the building and their homes. Another important consideration would be to offer transitional housing apartments within the building complex. In doing so, tenants would have a place to live while they are regaining their finances in the case of unemployment, rather than simply evicting them. By offering transitional housing, tenants can ‘get back on their feet’ and potentially even move back to their previous rental apartment. Finally, implementing a rent-to-buy scheme is just as important to provide low-income residents the opportunity of becoming first time homeowners,

such opportunity that is rare in Cape Town and would make an immense difference in the low income population's lives.

It is essential that all residents have equal access to social amenities that would be implemented either on the first few floors or in the surroundings of the building. These amenities must apply to all residents' needs, despite their economic background, as referenced in section 1.4. It is counterintuitive to implement 'high-end' amenities such as luxurious cafes/stores and expensive services in the name of promoting innovation. The design would become 'out of touch' with the residents' true needs, given many residents would not be able to utilize such amenities. All tenants should have access to the same high-quality and accessible amenities to promote inclusivity and social integration of lower-income groups. The equitable standard should also be reflected in the design of the apartments themselves. Despite the different amenities within open market units and affordable housing options, all units should maintain the same quality standard and should look the same from the outside of the building (tenure blind) to promote inclusivity (JSP Development Services, 2021, p. 7).

Finally, it is fundamental to understand the residents' backgrounds and their psychosocial needs. Many residents carry trauma from their previous living situations. Therefore, it would be ideal to implement psychosocial support programs within the building. These programs can be held in the common spaces of the building and can include but are not limited to counseling sessions, occupational therapy, and mental health courses. The goal of these programs is to increase residents' sense of well-being and belonging, consequently creating a better sense of community within the building. Another form of social support that would make an immense difference in the tenants' lives is implementing an economic development program. This program would include classes teaching basic financial sustainability such as budgeting, career development, setting up savings, and how to get out of the "blacklisted" status. The implementation of these programs would promote more economic mobility and independence from government subsidies, and consequently the building would become more self-sustainable.

2.2 Locational Considerations:

The guiding principle in determining the location of a new project should be promoting densification. This would mean bringing people to existing utilities and services, instead of implementing new utilities and services further from the CBD. Therefore, the location of the site should be in an area that allows easy access to social amenities such as healthcare, education, childcare, utilities, and other resources. The infrastructure should be within a reasonable walking distance from the site. Areas that do not have preexisting infrastructure that is needed for a THM development should not be considered as feasible. These include, but are not limited to, water, electricity, sanitation, and stormwater management. Below is a diagram from the City of Cape Town's Municipal Spatial Development Framework which depicts the capacity for these essential amenities in the Western Cape province:

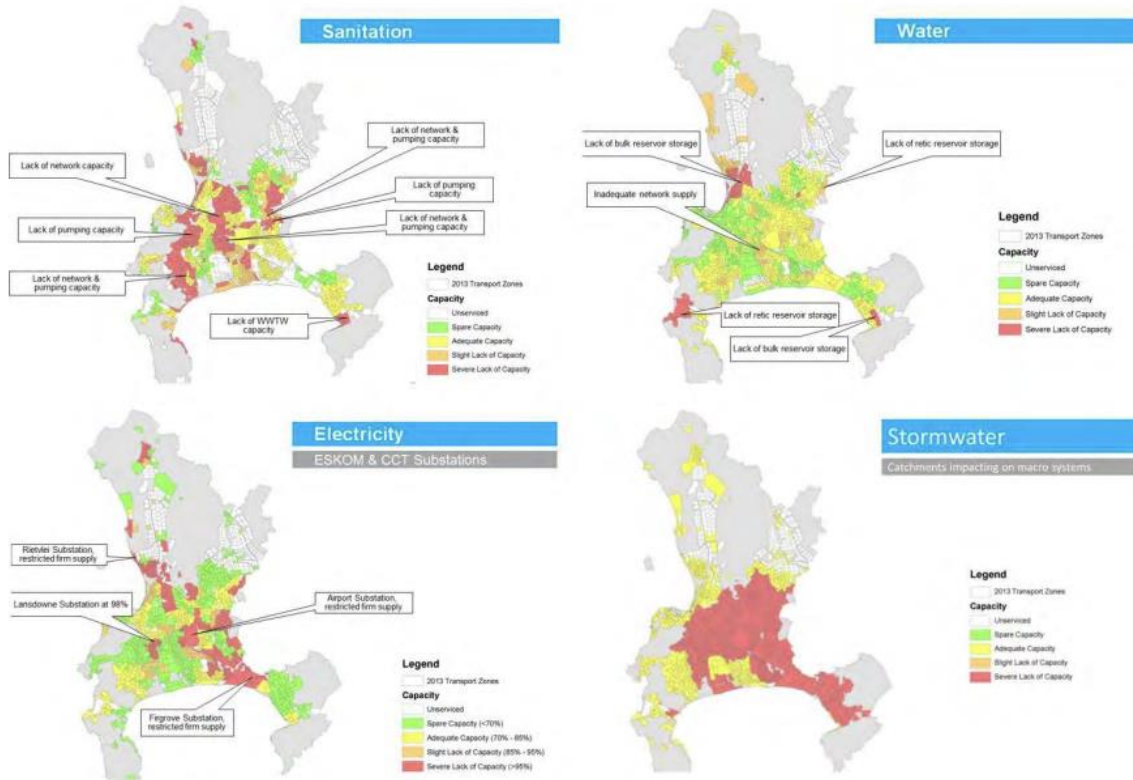


Figure 5: "Current infrastructure capacities associated with the sanitation, water, electrical and stormwater networks." (City of Cape Town, 2022b)

One notable exception exists to the above requirements; site connectivity to the surrounding area can improve the shortfalls that can come with the lack of social infrastructure. What this means is if a site can be deemed feasible even with a lack of social infrastructure in the immediate area, if connection to adequate public transportation exists. An example of this can be seen in a site called Pickwick. As described previously, this site should not be an acceptable site as it lacks essential social infrastructure in the immediate area as shown by Image 1 (JSA Architects and Urban Designers, 2021). Pickwick became an acceptable site by counterbalancing the lack of social infrastructure with its proximity to major roads. In this case, the major roads would allow for public transport to necessary social facilities.

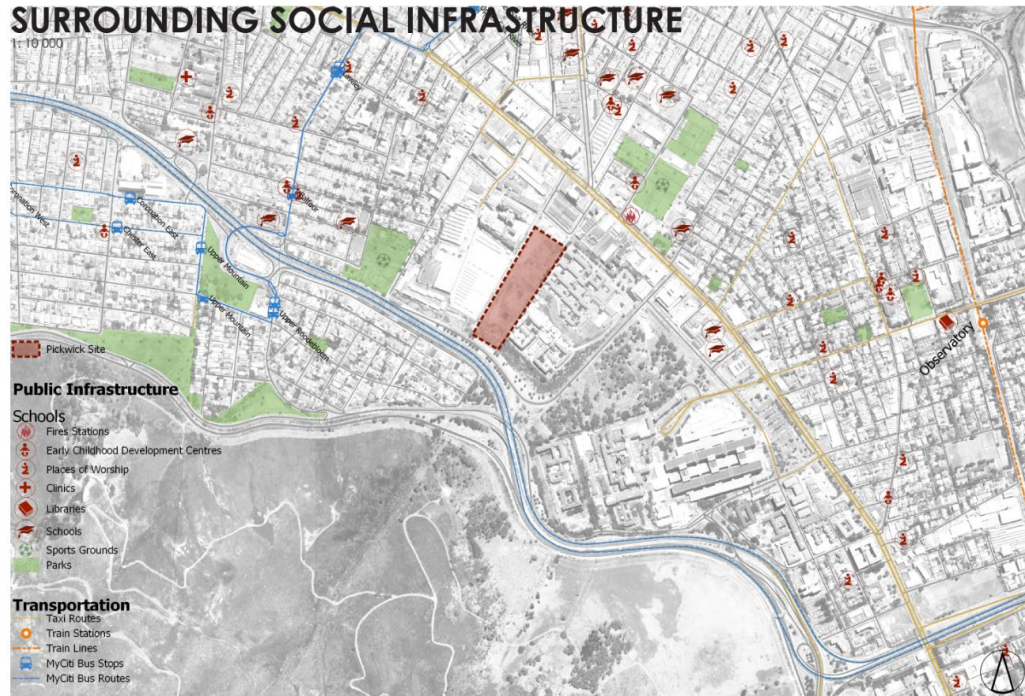


Image 1: Map of Pickwick site demonstrating social infrastructure surrounding the site. (JSA Architects and Urban Designers, 2021)

Using the information above, a compiled checklist of the necessary social amenities in a given area to be considered feasible for the THM is included in Figure 6 below. The feasibility of a site in this checklist is based on “reasonable” access to these social amenities. It is important to note that the term “reasonable” depends on a given project, however the figure provides a summary of key amenities that should be considered.

To be deemed feasible, a site should have reasonable access to:	
<input type="checkbox"/> Transportation <ul style="list-style-type: none"> <input type="checkbox"/> A MyCiTi bus stop <input type="checkbox"/> Golden Arrow Bus Services (GABS) <input type="checkbox"/> A Metrorail Western Cape station <input type="checkbox"/> Metered/Minibus taxis <input type="checkbox"/> Private transportation (Access to major roads, highways, and parking) 	<input type="checkbox"/> Essential Goods <ul style="list-style-type: none"> <input type="checkbox"/> Grocery stores <input type="checkbox"/> Clothing stores <input type="checkbox"/> Pharmacies <input type="checkbox"/> Home goods stores <input type="checkbox"/> Convenience stores <input type="checkbox"/> Petrol stations
<input type="checkbox"/> Healthcare <ul style="list-style-type: none"> <input type="checkbox"/> Emergency medical services <input type="checkbox"/> Clinics/General women's and men's health services <input type="checkbox"/> Child healthcare <input type="checkbox"/> Psychiatric care 	<input type="checkbox"/> Essential Services <ul style="list-style-type: none"> <input type="checkbox"/> Electricity <input type="checkbox"/> Waste management <input type="checkbox"/> Water supply <input type="checkbox"/> Sewage <input type="checkbox"/> Stormwater management <input type="checkbox"/> Sanitation <input type="checkbox"/> Information and Communication Technology (Wifi, towers, and antennae) <input type="checkbox"/> Safety and Security services <input type="checkbox"/> Financial and banking services <input type="checkbox"/> Opportunity for work
<input type="checkbox"/> Childcare <ul style="list-style-type: none"> <input type="checkbox"/> Preschool/Daycare 	
<input type="checkbox"/> Education <ul style="list-style-type: none"> <input type="checkbox"/> General education public schools (Grades R - 9) <input type="checkbox"/> Private/International public schools <input type="checkbox"/> Universities <input type="checkbox"/> Technical Vocational Education and Training (TVET) colleges 	

Figure 6: Essential social amenities checklist for properties to be deemed feasible.

2.3 Legislative Considerations

Section 26 of the Bill of Rights included in The Constitution of the Republic of South Africa 1995 states, “Everyone has the right to have access to adequate housing [...] The state must take reasonable legislative and other measures, within its available resources, to achieve the progressive realization of this right.” It is therefore the City of Cape Town’s responsibility to not only provide housing to all citizens, but to ensure that housing is “adequate”.

With the introduction of the new Spatial Planning and Land Use Management Act 16 of 2013 (SPLUMA), there exists a new framework in the spatial planning surrounding new housing projects. This framework works to provide housing where “the intention is to create the conditions for social, cultural and economic development that enables the empowerment of citizens who are then able to participate in the full spectrum of activities in their communities” (Department of Human Settlements; Planning Directorate, 2019a). This goal is summarized in Figure 7 below which has been compiled in the Guideline for the Preparation of Municipal Human Settlement Plans; Background and Resources Document:

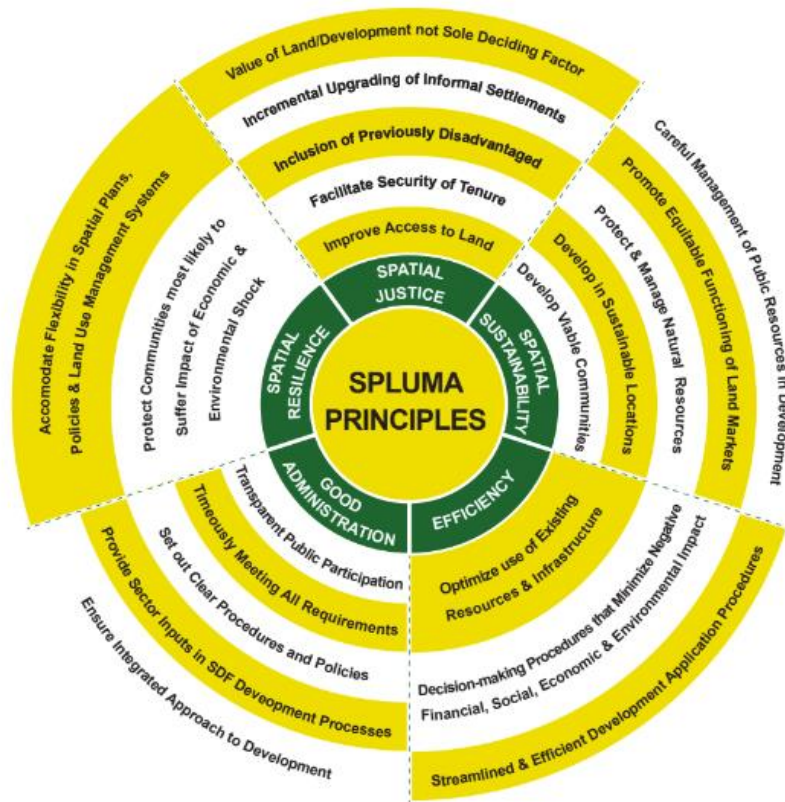


Figure 7: Summary of key elements of the SPLUMA (Department of Human Settlements; Planning Directorate, 2019a)

New housing projects should adhere to the SPLUMA principles and follow the intention to provide more efficient, inclusive, and sustainable spaces. A checklist in the guidelines includes important questions to ensure new projects follow the sustainable principles. The checklist is scored based on a yes or no answer to each question, with an ideal project having a total score of 30. The checklist is seen in Figure 8 below:

Category	Question	Yes	No	Category	Question	Yes	No	
Land Use, Activities and Social Services	Does the proposed development include a mix of activities such as spaces for businesses, workshops, shops, cafes etc?	1	0	Infrastructure: Services, Layout and Housing	Has existing engineering infrastructure capacity been considered to accommodate the new development?	1	0	
	Does the proposed development include social facilities such as schools or clinics?	1	0		If new infrastructure is to be installed - what are the capacities and can it potentially accommodate future expansion?	1	0	
	Will new schools be required (or are future residents already living in the area with children already attending schools in close proximity?)	1	0		Has green building standards and technologies been incorporated into the design of services and housing?	1	0	
	Does the proposed development include community services?	1	0		Do block widths conform to the minimum distance for pedestrians to walk to nearest service or destination? 60m	1	0	
	Are social and community services and mixed use activities clustered in areas of highest access?	1	0		Does the exterior edges of the development face outwards to ensure for safety and exposure?	1	0	
	Does the layout allow for a local destination or centre within the development to create a "heart" for the neighbourhood?	1	0		Has walls been avoided as far as possible to avoid for dead spaces lack of interaction with surrounding neighbourhoods?	1	0	
	Does the development include opportunities for sustainable employment or skills development (more than just construction jobs)?	1	0		Are street frontage of residential plots as narrow as possible to optimise engineering services provision?	1	0	
	Does the development positively respond to and complement surrounding land uses?	1	0		Typologies and Design	Has landscaping been included in the budget for implementation and design?	1	0
	Does the development include public transport facilities such as bus or taxi stops?	1	0			Are these spaces linked in the form of a network of public spaces, parks, greenways etc?	1	0
	Does the layout allow for active open spaces, public spaces and linked NMT routes?	1	0			Does the development include a variety of housing types, sizes, densities and/or tenures? (Always aim for medium density of 40-100 du/ha gross)	1	0
Infrastructure: Transport and Roads	Does the layout of roads link into the surrounding movement network?	1	0	Are higher density typologies strategically located around social facilities and soft and hard open spaces?		1	0	
	Does the layout allow for future connections into new developments that could come in future or areas for possible expansion?	1	0	In the case of brownfield developments - are there any existing buildings on site that could be refurbished for cultural significance or repurposed for a specific use?		1	0	
	Does the layout of roads follow a hierarchy and grid structure to create permeable streets that area safe and legible? (layouts that use unnecessary curves are costly)	1	0	Do plot sizes allow for possible backyard dwellings or incremental changes to structures?		1	0	
	Are sidewalks clearly defined and wide enough to ensure for NMT/cycling, spaces for trading?	1	0	Are houses facing onto the street to create active neighbourhoods and clear eyes on the street?		1	0	
	Are there existing footpaths on the site and how have these been incorporated?	1	0	TOTAL SCORE		30	0	
	Does the development allow for community urban agriculture projects?	1	0					

Figure 8: “Checklist for Layout Plans to ensure for Sustainable Neighborhoods” (Department of Human Settlements; Planning Directorate, 2019a)

According to the Cape Town Municipal Spatial Development Framework (MSDF), applications for new developments are checked against a variety of documents which includes, but is not limited to, the City of Cape Town Integrated Development Plan (IDP), the MSDF, the District Spatial Development Framework (SDF), and the City of Cape Town Municipal Planning By-law (MBP-L) (City of Cape Town, 2022b). Of all these documents, the MSDF serves “as the principal policy tool for evaluation applications for new or enhanced land use rights” (City of Cape Town, 2022b). This document will provide most guiding principles in the creation of new developments.

A key focus of the MSDF is collaboration among the National, Provincial, and City spheres of government. Therefore, it is essential that the THM incorporates efforts to facilitate collaboration among these entities. Below is a document in Technical Supplement D of the MSDF which displays necessary legislation for spatial development that must be considered on the National, Provincial, and City level (City of Cape Town, 2022b).

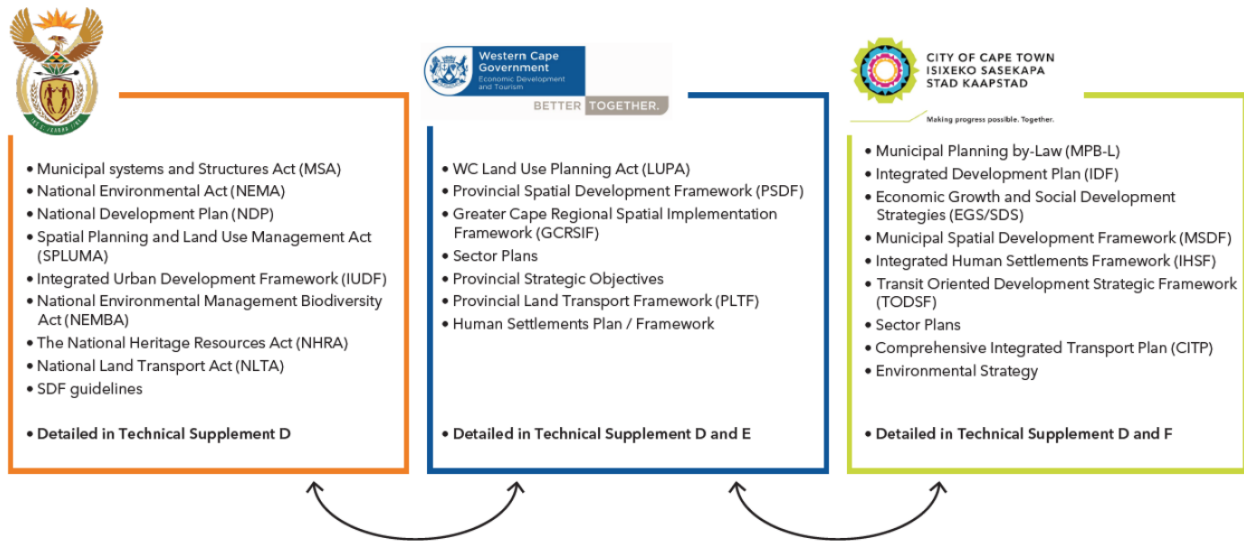
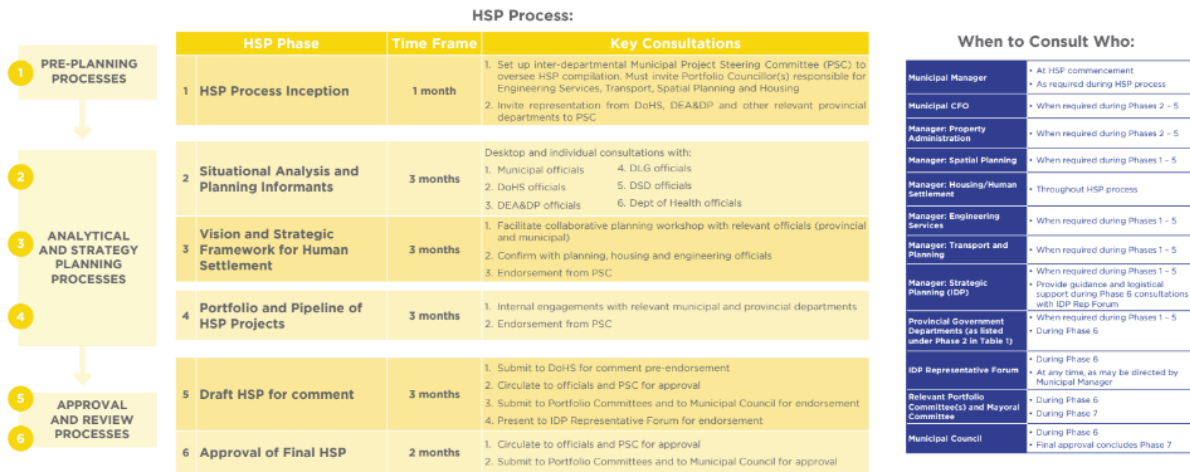


Figure 9: Diagram D1 of the Municipal Spatial Development Framework: Policy context across the spheres of government (City of Cape Town, 2022b)

The Planning Directorate of the Department of Human Settlements outlines a process for generic Human Settlement Plans (HSPs). This includes 3 overarching processes with 6 total phases that details the creation of municipal HSPs from inception to approval. Figure 10 displays the 6 phases within the pre-planning, analytical and strategy planning, and approval and review processes. Also included is an outlined timeframe for these phases, a list of important stakeholders, and when to contact them. Figure 11 contains a series of chapters with more details on each phase and the outcomes/deliverables from each phase (Department of Human Settlements; Planning Directorate, 2019b). These figures are included below:

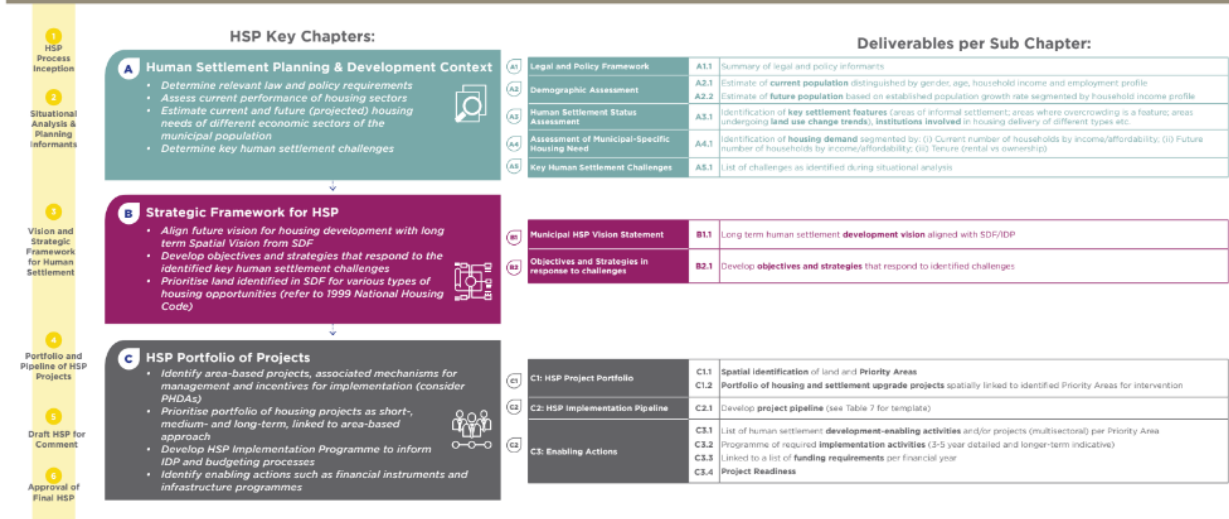
PROCESS



KEY CONSULTATIONS

Figure 10: “Generic Municipal HSP Process and Engagements” (Department of Human Settlements; Planning Directorate, 2019b)

CONTENT



DELIVERABLES

Figure 11: “HSP Key Chapters” (Department of Human Settlements; Planning Directorate, 2019b)

Using the guiding principles set out in Figure 7, the checklist in Figure 8, and the processes laid out in Figures 10 and 11, this chapter provides the necessary legislative framework to create sustainable Transformative Housing Model developments. This chapter provides a brief overview of key legislation that should be referenced; however, a more in-depth review of the referenced documents will be necessary upon the start of this project. Examples of this documentation include the Municipal Planning By-Law (MPB-L), Integrated Development Framework (IDF), Municipal Spatial Development Framework (MSDF), Integrate Human Settlements Framework (IHSF), National Environmental Act (NEMA), and the Human Settlements Plan/Framework for the Western Cape. The full range of legislation that must be considered from the national, provincial, and municipal perspectives is depicted in Figure 9 above. To ensure the following of all necessary legislation, the municipalities must approve any THM model before its implementation.

2.4 Building Structural Considerations

Proposed sites for a THM development could be vacant commercial and industrial buildings. To repurpose these buildings for residential use, they must fall within certain zoning specifications. Because this model aims to promote densification, appropriate zoning for a THM development would be under a high density residential/mixed use classification; a large building with several floors, many units per floor, varying sizes of units, and allowance for businesses to operate in that same building. The vacant commercial and industrial buildings of interest for the THM, however, will most likely already be classified under an industrial or business classification. Therefore, it is likely that a rezoning of the land for a THM development will be necessary. The rezoning process is described in section 44(6) of the City of Cape Town Municipal Planning By-Law where it states: “the City may on its own initiative rezone land which it does not own to give effect to approved spatial development frameworks and other City policies” (City of Cape Town, 2019). Since the THM follows other City policies aimed at making more sustainable and integrated neighborhoods explained in the sections above, it seems like rezoning would be feasible through the proper rezoning application process.

The city of Cape Town has made available an interactive City Map and Zoning Viewer on their official website. This viewer can be found using the following link: <https://www.capetown.gov.za/Work%20and%20business/Planning-portal/Online-planning-and-building-resources/Online-zoning-viewer>

This resource can be used to help keep track of current zoning and areas set for rezoning. The Image below is a snapshot of the City Map and Zoning Viewer showing the Pickwick site. You can see various zoning classifications such as general business, general industrial, and general residential.

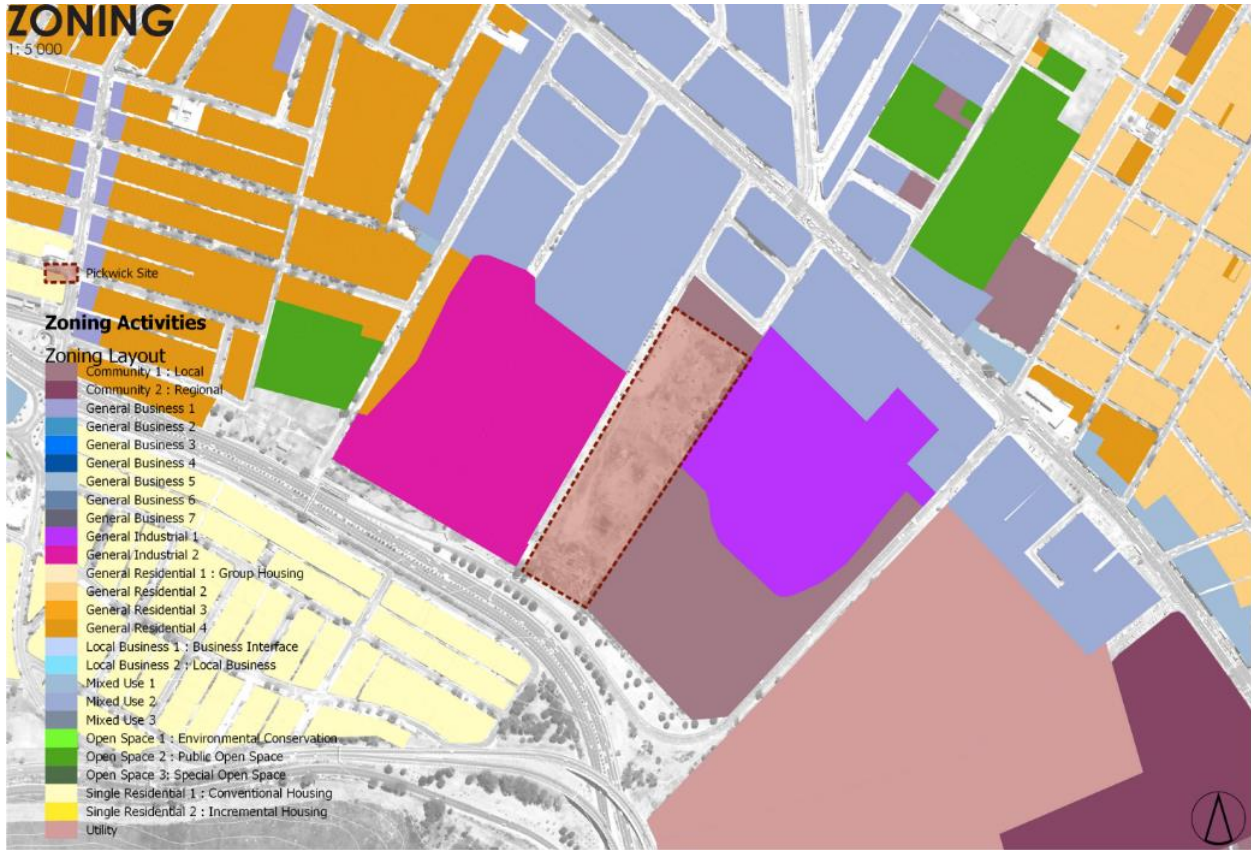


Image 2: Zoning of the surrounding area of Pickwick (JSA Architects and Urban Designers, 2021)

Before any thought can be put into design, these buildings must be surveyed by qualified professionals to ensure that they have not passed their structural lifetime. These buildings must also be assessed to ensure the structural feasibility of retrofitting into housing. To identify the structural and conversion feasibility, a series of surveys must be conducted which may include general structural, mapping, topographical, environmental, and geotechnical surveys. If the building is deemed not structurally sound or cannot be modified into the desired housing, it should be deemed not feasible for the THM.

All structural analyses can be checked against the National Building Regulations and Building Standards Act No. 103 of 1977. This extensive piece of legislation was created “for the promotion of uniformity in the law relating to the erection of buildings in the areas of jurisdiction of local authorities; for the prescribing of building standards” (Republic of South Africa, 2008). This document covers topics such as general principles and requirements, structural design, public safety, floors, walls, stairways, lighting and ventilation, fire protection, energy usage, and more (Republic of South Africa, 2008). This document therefore provides all necessary information on whether a given building is feasible for retrofitting into housing and should be used for a THM development.

2.5 Smart Technology Enhancements

The City of Cape Town Integrated Human Settlements Sector Plan (IHSP) is a document outlining the Human Settlements contribution to the City's five-year Integrated Development Plan (IDP) plan starting in 2022. Section 1.5.8 of the IHSP, "City's Climate Change commitments", details various commitments taken by the City of Cape Town towards climate friendly policy. More specifically this section mentions that the City of Cape Town is a member of a global leadership group named C40 (City of Cape Town, 2022a). This group advocates for effective governmental responses to reduce climate change at a local level. Following these initiatives, the IHSP states "the city is committed to accelerating transformative climate action by delivering carbon neutrality for all new buildings by 2030" (City of Cape Town, 2022a). New technologies should therefore be considered to move towards carbon neutrality.

Alternative Building Materials and Systems (ABMS) are key to building environmentally sustainable buildings. Typically, ABMS are materials and systems aimed towards maximum resource efficiency. These can range anywhere from solar panels, motion sensor lighting, and LED lights for energy efficiency to water saving faucets and gray water recycling systems for water use efficiency. An example of a low-income housing project which incorporated green initiatives is the Belhar CBD project. Here, "energy saving technologies such as solar water heaters, heat pumps, improved insulation and gas were ... employed in the project. Residential recycling projects, food gardening and urban greening initiatives are currently also being investigated" (Western Cape Department of Human Settlements; Policy and Research Directorate, 2018). Choosing which materials and systems are best suited for a given project, however, depends entirely on the details of that project. For this reason, partnering with an ABMS provider could be useful as they will be able to provide suitable feasibility assessments for their green technologies on a given project.

A study was conducted in 2019 on the benefits of alternative technologies for low-income housing in Cape Town. The study identified alternative technologies that can aid in the cost, durability, and manufacturability of materials used in construction. These materials include alternative block systems, new forms of insulation, and paneling systems. All the technologies identified have the potential to provide benefits, however not all are feasible (Grady, Brendan, Dante Muzila, Kate O'Neill, and Arden Tanner, 2019).

One factor the study highlights is the influence of public perception. When it comes to housing in South Africa, the public generally gravitates towards the traditional brick and mortar style of housing. This is most likely due to familiarity with traditional materials in housing. The unfamiliarity with new alternative materials conversely creates a lack of trust in residents regarding their durability and effectiveness. This makes it difficult to convince people to trust and live in buildings that utilize alternative technologies (Grady, Brendan, Dante Muzila, Kate O'Neill, and Arden Tanner, 2019). It is essential that if ABMS are to be used that potential residents are informed on the new material, its benefits, and uses. An example of how to achieve this may be through infographics and advertisement campaigns. Below is an infographic made by the 2019 study detailing the uses and benefits of sandbag building:




Alternative Building Technologies

SANDBAG BUILDING

How Does it Work?

- 

1 A timber frame is constructed
- 

2 Sandbags are stacked into the frame
- 

3 A fiber mesh and plaster are put on the walls

Advantages

- 

Acoustically Insulating
- 

Bulletproof
- 

Thermally Insulating
- 

Water Resistant
- 

Fireproof

Figure 12: Infographic displaying the uses and benefits of sandbag building housing (Grady, Brendan, Dante Muzila, Kate O'Neill, and Arden Tanner, 2019)

2.6 Financial Considerations

When determining the financial feasibility of a project there are two questions that need to be answered; how much will it cost and who will pay for it? This section begins with an analysis of potential development costs of the THM. This provides a ballpark cost estimate based on previous affordable housing projects. Next this section outlines potential investors and funding schemes. This section discusses revenue streams and important concerns with financing the THM.

The estimated cost to develop the THM is expected to fall within the range of R17,661.50 to R19,756.50 per square meter. This range was determined by referencing data from previous housing projects, such as the Pickwick Site, and consulting with experts in the field (JSP Development Services, 2021). Additionally, the Social Housing Regulatory Authority provided average and high estimates for the cost of developing social housing units, which aligned with the financial information from the Pickwick Site (Alcari Consulting, 2018). Based on this information, an average low and high estimate for the general development cost per square meter of an affordable housing project was derived. The THM is divided into four main space categories: common space, storefronts, social housing, and open market units. Table 1 below provides an example of how these space categories might be distributed. The development cost for each space category is calculated by multiplying the overall development cost per square meter by the percentage allocated to that space category. These costs can then be added together to determine the total development cost per square meter, which can be converted into cost per hectare for different development sizes. Formula 1 and 2 below summarize these calculations. Note that the percentage allocated to each space category can be adjusted as needed for a given project.

$$\begin{aligned} \text{Formula 1: Dev. cost of space type} \\ &= (\% \text{ allocated to space} \times \text{general development cost per m}^2) \end{aligned}$$

$$\begin{aligned} \text{Formula 2: Total dev. cost} \\ &= \text{dev. cost of common space} + \text{dev. cost of storefronts} + \dots \\ &+ \text{dev. cost of parking} \end{aligned}$$

Space Type	% GCA Allocated to Space Type	Development Cost per sq m		Cost with respect to allocated space per sq m	
		Low	High	Low	High
Common Space	20.00%	R17,460.00	R19,530.00	R3,492.00	R3,906.00
Storefronts	15.00%	R15,730.00	R17,600.00	R2,359.50	R2,640.00
Social Housing	20.00%	R13,310.00	R14,880.00	R2,662.00	R2,976.00
Open Market Housing	45.00%	R21,550.00	R24,110.00	R9,697.50	R10,849.50
TOTAL	100.00%			R18,211.00	R20,371.50

There are many different types of investors that developers can seek out to provide funding for new projects. Not only do these investors exist across the public-private sector of South Africa, but they may also be international. These investors provide funding for projects, but only if developers can show they can meet the stipulations put forth by the investors. These stipulations could be anywhere from meeting green initiatives to providing housing for low-income residents. An example of this is seen through a major investor at the national level called the Social Housing Regulatory Authority (SHRA). They offer grants such as the Consolidated Capital Grant (CCG) to developers. This grant provides funding for rental housing up to R328,867 per unit. This funding, however, comes with the condition that the developer must ensure the housing is affordable, well-constructed, and in a well-located area (Social Housing Regulatory Authority, 2021). Some investors for affordable housing projects can be seen below in Figure 13.

Type of investors	Examples of institutions/ organisations
Government Investment	<ul style="list-style-type: none"> • The National Housing Finance Corporation (NHFC) • National Urban Reconstruction and Housing Agency (NURCHA) • Rural Housing Loan Fund (RHLF) • Social Housing Regulatory Authority (SHRA)
Foreign Institutional Investors	<ul style="list-style-type: none"> • DFI Investment • International Private Equity
Foreign Institutional Investors	<ul style="list-style-type: none"> • Capital Markets • Real Estate Investment and Service companies
Pension Funds	
Financial Service Providers	<ul style="list-style-type: none"> • Old Mutual
Private Equity	<ul style="list-style-type: none"> • International Housing Solution • Musa Group

Figure 13: Examples of institutions and organizations that provide funding to developers (South African Housing and Infrastructure Fund, 2020)

The grants received by developers from these investors will not cover the total cost of development. This means a certain amount of funding needs to come from the developer themselves. When that occurs, developers will make up the shortfall in equity. This can come from profits from increasing the selling price of private market spaces. In the THM this could mean increasing the selling price of open market units and storefront to cross subsidize the affordable housing units.

The THM's aim to provide affordable housing should be reflected in all aspects of the financial considerations, including rental costs and levies. Following this aim, the body corporate should ensure that units are being sold and rented to tenants in an affordable and sustainable manner. Additionally, levies prescribed by the body corporate should be given equitably according to the unit. This would rely on 2 main factors: standard and non-standard levy costs. There will be a standard rate that is reflective of the cost to maintain communal areas, amount of money that the body corporate sets aside for future projects, as well as the cost to cover the salary of managerial staff. This will be distributed according to unit size per square meter. The second factor is based on the utility costs for the specific unit. Each unit's utility usage will be transparently monitored by the board of trustees and charged accordingly.

It is important to note that all calculations and prices above are based on averages of previous affordable housing projects. These should only be referenced as a general idea of the cost of this project. Many aspects of the project such as location or materials used will alter costs greatly from the above metrics.

2.7 Marketing Strategies

There is a huge misconception around affordable housing projects and their benefits. Many low-income residents have not heard of new affordable housing schemes, not learned about the opportunities offered, or are simply ignorant of their true function (DAG Representative, personal communication, November 11, 2022). The lack of understanding has caused the people of Cape Town to associate new affordable housing schemes with previous government relief efforts, such as fully subsidized, poorly designed government housing. The inclusion of affordable housing in the THM suggests that the stigma surrounding affordable housing may also extend to the THM. Therefore, rebranding affordable housing and increasing its visibility through advertising could help the THM distance itself from that association. To break away from that stigma, the promotion of a lifestyle rather than the building itself is key. This lifestyle must be one that promotes inclusion, economic development, and sustainability. This way, potential residents view the transformative housing model to access a better life and are more encouraged to participate. It is recommended that the HSD hire professionals to create advertisements that cater to this lifestyle to all prospective stakeholders.

In order to appeal to potential residents there must be targeted advertisements for the 3 main groups to market to: low-income residents, middle to high income residents and potential developers. The focus on these groups and their corresponding marketing strategies is the result of a comprehensive review of previous housing projects and expert consultation. The figure below displays these groups and their respective marketing strategies.

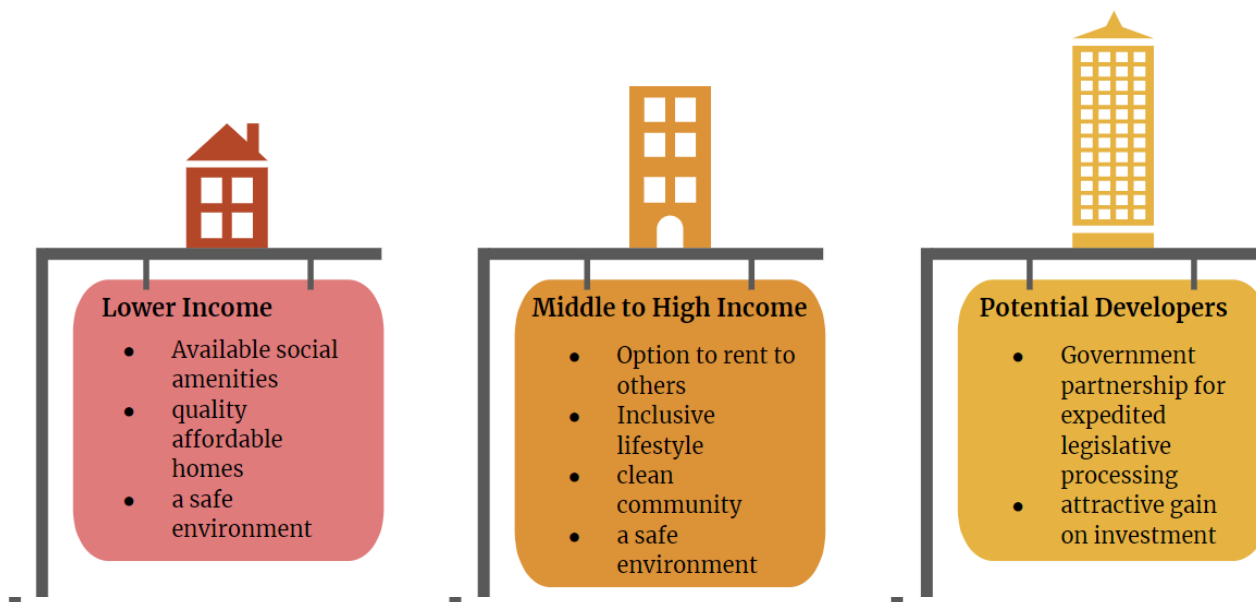


Figure 14: Diagram demonstrating main marketing focuses according to each targeted group

When marketing to lower income residents, the key is to target social amenities provided and proximity to public transport. These residents are in the income range of R1500 -R22000 per month and therefore qualify for affordable housing subsidies. Marketing social amenities that might not have been available to these residents such as the businesses on the ground floor, free wifi in communal areas, and communal laundry will attract many potential residents. By targeting advertising that displays similar units for both open market and affordable housing, it will promote a perception of equity in this model. This equity will be appealing to lower income residents who wouldn't have access to quality housing otherwise. The best approach to target this group is to hire professionals to distribute brochures in the areas these communities live in. Another strategy would be to advertise through social media, to target a larger sample of low-income residents.

The THM must also appeal to middle to high income tenants residing in the open market and luxury apartments. These residents are in the income range of R22000 per month and above. When marketing to these groups, transparency is key to ensure residents are willing to participate in the lifestyle of an inclusive community. Marketing gated perimeters, facial or passcode secured building entry, and around the clock security guards will appeal to these residents. Additionally, communal areas and surrounding streets must remain clear of trash and crime. Quality appearance of the building and its amenities is key to attracting the high-income residents along with online advertisement. The option for high income earners to buy a property with the intention to rent to a tenant rather than live there themselves should also be advertised. This way, even if they are not willing to live in a project like this, they can still contribute and become an owner of a unit.

Finally, the Transformative Housing Model must also appeal to potential developers. To appeal to private developers, it must be clear that they will benefit financially and managerially through this scheme. Under the THM, a private developer will benefit from a partnership with

the City of Cape Town government due to expedited land release processes of ideal properties under certain stipulations. Under this purview, a private developer might receive expedited and discounted rezoning and sale of land from the city, but only if they ensure a certain amount of the development is reserved for low income residents. Private developers will be looking for a secure plan with reasonable gain on investment from developing this housing scheme. For this reason, an acceptable level of profit for the developer must be included in the scheme. Holding conferences and personal contacts with private developers will be the best way to market the THM.

It is important to understand and acknowledge the history of housing in South Africa, more specifically, Cape Town. Many times, gentrification is enabled due to efforts to regenerate neighborhoods. With this, historical areas are transformed in the name of promoting innovation, consequently increasing the market value of that area. In doing so, citizens that have occupied that area for many generations are 'driven out' of the neighborhood because they can no longer afford that area's cost of living. Therefore, it is crucial to market the Transformative Housing Model as giving low to mid-income residents 'a place' in that area. This way, we aim to achieve the exact opposite of gentrification by welcoming long-term residents into the area rather than driving them out.

Chapter 3: How We Envision It

This chapter provides an example of how the above considerations can be used to create a THM development. The hypothetical below is not the only way to design a THM development and should be modified to match site specifications.

Following chapter 1, the THM development envisioned includes the mixed use, mixed income, and mixed tenure programs. This would mean having business and residential units in one building all sold on a sectional title ownership framework. The explanation of the sectional title framework is described in section 1.3. The residential units would aim to provide housing for low-, middle-, and high-income residents. This mixed income approach integrates groups of different economic backgrounds into one residency.

To ensure this project is following necessary principles seen in recent legislation as outlined in section 2.2, the checklist in figure 5 and the SPLUMA principles prescribed in figure 4 should be used. These resources provide a good foundation for decision making throughout this project. Figures 7 and 8 contain the legislative processes that must be considered throughout this project. The six phases outlined in figure 7 guide the project from inception to approval considering the pre-planning process, analytical and strategy planning process, approval and review process, and key consultations along the way. This provides a general timeline for each phase, a content breakdown for each phase, and when to contact the key consultants.

Following the structural considerations in section 2.4, the site for this THM development is a vacant 5,000 square meter industrial building currently in an industrial zone. It consists of two floors each with a 2,500 square meter area, 1000 square meters for common space, and 250 square meters for parking. An application has been submitted and approved for rezoning into a more appropriate high density/mixed use classification. Additionally, preliminary surveys of the site confirm that the building is still structurally sound, can be modified, and is in an approved area for new construction (There are no environmental or cultural relevancies that must be taken into account before construction).

Following considerations from sections 2.3 and 2.1, this site has reasonable access to essential social amenities according to the checklist in figure 10. This site does lack 3 things within walking distance however: Universities/TVET schools, home goods stores, and financial/banking institutions. Luckily, this site is close enough to major roads to have access to both metered/minibus taxis and a MyCiti bus stop. Due to the site's connectivity to public transportation, this site has still been deemed viable despite this shortfall. These amenities have also been surveyed and found to be used by both low-, middle-, and high-income earners. This is essential to the integration of lower income residents as this allows less separation between income groups.

The main objective of this building is to provide affordable housing in an environment that allows for economic growth and social mobility for low-income earners. This means much of the housing should be affordable and the rest should be made up of storefronts, common spaces, and some higher income earners. As such, this THM development will be broken into the

following percent allocation of space: 20% social housing, 20% affordable open market units (included as open market), 20% common spaces, 20% Standard open market, 15% storefronts, and 5% luxury housing. Affordable and social housing units come in 32 and 42 square meter sizes, whereas standard open market units come in 22, 32, and 42 square meter sizes. Storefront units come in 75 and 100 square meter sizes and luxury units only come in a 52 square meter size.

Following a tenure blind approach outlined in section 2.1, there should be no major distinctions in quality between areas occupied or used by lower income earners when compared to areas occupied or used by higher income earners. As such, affordable housing units will be within the same residential areas as open market units and storefronts in the first floor will cater to both high and low income earners. This will allow for lower income earners to feel more equal and integrated with the rest of the community.

Following the City of Cape Town's green initiatives detailed in section 2.5, various forms of energy saving smart technologies will be incorporated into our project. The technologies chosen for this project are automated motion sensor lighting to save on electricity, water saving shower heads and faucets, and gray water recycling systems to save on water. This will not only lower costs of electricity and water but lower the usage of each which limits the environmental impact. Additionally, this project partnered with an alternative building materials provider that makes new kinds of paneled walls. These walls are made of environmentally friendly and recycled materials. They were used in the construction of units within the allocated floor space which saved on cost and time spent on construction.

The estimated total cost to develop this site is in the range of R91,055,000 to R101,857,500. This was derived by multiplying the total space of the site (5,000 square meters) by the cost estimates per square meter of R18,211.00 and R20,371.50. The cost estimates per square meter of the THM can be found in Table 1 of section 2.6. Formula 3 and 4 below summarize these calculations.

Formula 3: Estimated Low Development Cost = 5,000m² × R18,211.00 = R91,055,000

Formula 4: Estimated High Development Cost = 5,000m² × R20,371.50 = R101,857,500

Following the funding schemes detailed in section 2.6, there are multiple investors that can contribute to this project. A detailed list of possible investors can be seen in figure 12. An example of an investor in this project is the Social Housing Regulatory Authority (SHRA). Due to the inclusion of social housing in this development, they would be an ideal investor as they provide funding for rental social housing up to R328,867 per unit via the Consolidated Capital Grant (CCG).

Finally, following considerations from section 2.7, advertising for this project should be less about the building itself and more about the lifestyle. This lifestyle is one that promotes inclusivity, sustainability, and a clean style of living. That way the building is seen as a necessity in order to achieve that desired lifestyle. This project was marketed to 3 main groups: low-

income residents, high income residents, and potential developers. To be most effective, advertisements should be tailored to how desired groups would interact with them. For example, if the low-income residents use cell phones, then the advertisements should be distributed on media accessible on cell phones. To advertise the effectively, advertisements were distributed through online media, pamphlets handed out in public, and billboards on popular transportation routes.

Chapter 4: Conclusion

The proposed guidelines for the Transformative Housing Model have the potential to redesign affordable and government-subsidized housing. This model gives an outline for how the HSD should address the housing crisis by creating economically and socially self-sustainable buildings independent of continual maintenance from HSD and initial private investors. The Transformative Housing Model creates a self-sustainable community within one building, in other words: 'a village all-in-one.' However, this addresses only one part of an intricate issue involving social inequities. Further steps will need to be taken by the HSD to minimize the gap between housing demand and availability.

These proposed guidelines aim to be the start of a long process toward mending social disparities through housing. Much work remains in finding a feasible alternative housing scheme that supports the City of Cape Town's housing initiatives. With strategic steps towards realizing sustainable alternative housing schemes, the Human Settlement Directorate could move forward in fulfilling the ever-increasing demand for housing.

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Appendices

Appendix A: Methodology of research

Our team worked alongside Cape Town’s Human Settlement Directorate to aid with the current housing shortage. The goal of this project was to promote sustainable urbanization by developing a model for the repurposing of underutilized industrial and commercial buildings into transformative housing properties. To meet our goal, we focused on the following three objectives:

1. Examine the implementation of mixed program models in affordable housing based on previous projects
2. Determine stakeholders' perspectives and preferences on repurposing properties into transformative housing
3. Develop a model for the repurposing of industrial and commercial buildings into transformative housing properties

1. Examine the implementation of mixed program models in affordable housing based on previous projects

This objective aimed to better understand the processes necessary to begin development on new mixed-use housing projects. This encompassed everything from the initial idea to the approval to begin construction.

Our team worked with the City of Cape Town and various urban city planners employed by the HSD to analyze previous and ongoing housing projects. These were commercial buildings, industrial buildings, or vacant lots scheduled for repurposing into mixed-use social housing. Our team identified social housing projects as the closest model completed to a mixed program framework. For this reason, we investigated the successes and shortcomings of processes practiced in creating suitable social housing.

When analyzing documents and project proposals, we looked for common threads and outliers between the proposals and outcomes of similar housing projects. This helped us gain insight into which decision factors were worth pursuing. We also interviewed engineers and members of HSD about the process and implementation of housing projects to better gauge the process of creating a proposal. This gave our team not only the requirements set out by the city, but also improvements from what was seen in the practice in the creation of relevant housing projects.

2. Determine stakeholders' perspectives and preferences on repurposing properties into transformative housing properties

Our team was interested in the perspectives of various stakeholders involved in this project. In order to accommodate the needs of potential residents, we interviewed NGO representatives, urban city planners, and technical specialists such as engineers and architects. The purpose of interviewing these specific groups was to identify the essential social requirements as well as the physical feasibility of affordable housing projects.

Interviews were our preferred method of data collection as they allowed us to attain qualitative data conversationally. Using a semi-structured interview process, we were able to keep respondents on task with our questions while still allowing them the freedom to add additional information.

When interviewing, it was important that we positioned ourselves in a manner that did not imply we were leading but rather an amplifier of the respondents' voices. In the book *Researching the City: A Guide for Students*, it is further explained: "there is a risk that the power relations involved may limit rather than enable other voices to be heard" (Ward, 2020, p. 52). Our team proposed questions that minimized the risk of limiting their responses, thus preventing their experiences from being misunderstood. As the author also stated: "an interview is most valuable as a means of allowing and enabling people to discuss their own experience, their own position, and encouraging them to reflect on their understanding of it" (Ward, 2020, p. 52). Therefore, we learned from our respondents' experiences and implemented their perspectives in our proposal design.

We compiled public opinion from these interviews for the HSD. Interviews of NGO representatives and urban planners were all oriented to collect opinions on the necessities of a home and how to make those requirements feasible. Sample questions and scripts for each stakeholder are listed in the Appendices (see Appendix B-E). The qualitative data was interpreted and discussed in the Findings and Analysis chapter.

3. Develop a model for the repurposing of industrial and commercial buildings into Transformative housing properties

This objective aimed to create a guide of our recommended process for repurposing commercial and industrial properties into transformative housing developments. It was a consolidation of all processes and considerations that must be taken into account to successfully construct the mixed program model development previously described. The processes and considerations were an accumulation of all research conducted through sections 3.1 and 3.2. The guidelines addressed factors such as the management structure of the building and essential property considerations and even outlined potential partners in this development. Overall, it emphasized the importance of a public-private partnership and how each party would benefit from this model.

The guidelines were developed to fast-track the delivery of new kinds of housing that better align with the City of Cape Town's sustainability goals (See section 2.2). It would achieve this by providing the HSD with a foundation to propose the transformative housing model. By utilizing these guidelines, the HSD would have a concise overview of who is involved in the

creation of transformative housing developments, what each party's role would be in its creation and a general framework on how to engage with each party.

Appendix B: List of potential collaborations for the HSD regarding the development of the THM

The following list consists of potential partners the HSD could collaborate with in the development of the Transformative Housing Model. Underneath each potential partner is a brief explanation of how they could contribute to the development process.

Private developers:

- Calgro M3 (<https://www.calgrom3.com>)
 - This private developer is “A property investment company that specializes in the development of integrated residential developments such as BNG housing, CRU housing, GAP and FLISP housing, Social Housing, open market affordable housing and mid-to-high income housing.” (Calgro m3, 2022)
 - Calgro m3 could aid in providing investment or managing the selling of units.
- Greenfield Developments (http://www.greendev.co.za/about_us.html)
 - This developer “Was established with the clear intention of identifying property opportunities in the Western Cape on land that had hitherto been underutilized.” (Greenfield development, 2022)
 - Greenfield Developments could partner with the HSD as a developing partner for THMs and attaining underutilized properties for conversion.
- FWJK (<https://fwjk.co.za/>)
 - Real estate developer in Cape Town is “A professional services company that has been developing a wide range of developments with our disruptive Co-Development at Cost Methodology since 2008” (FWJK, 2022)
 - FWJK could partner with HSD in advertising the THM and promoting the lifestyle it offers.

Financial institutions:

- NHFC (<https://www.nhfc.co.za>)
 - National Housing Finance Corporation
 - “Our mission is to provide innovative and affordable housing finance solutions for the low-to-middle income market.” (NHFC, 2022)
 - The NHFC could aid in providing loans to private developers that will be investing in the THM.
- CAHF (<https://housingfinanceafrica.org/about/about-cahf/>)
 - Center for Affordable Housing Finance in Africa
 - “All of CAHF’s work is directed at shifting investor interest towards the much larger market of the emerging middle class in urban areas across Africa, and using this to champion both improved housing conditions and economic growth, while also addressing inequality with the asset potential that housing offers.” (CAHF, 2022)

- Could aid in the legislative financial process to ensure low income residents have fair opportunities at housing options and maintenance.
- Could also aid in getting better involvement of the private sector in the development of the THM, while implementing equitable policies.

NGOs:

- DAG (<https://www.dag.org.za>)
 - Development Action Group
 - DAG’s mission is to support community-led developments addressing all social discrepancies
 - “DAG is leading Non-Profit Organization that supports communities to strengthen community organizing; enabling affordable housing, land and tenure security; resist evictions; and shape urban development policies.” (DAG, 2022)
 - Could partner with the HSD in implementing equitable policies and regulations for low-income residents living in affordable housing units within the model.
- NASHO (<https://www.nasho.org.za/about/>)
 - National Association of Social Housing Organizations
 - “Its primary objective is to assist to build a strong and sustainable social housing sector in South Africa with Social Housing Institutions at the heart of the delivery.” (NASHO, 2022)
 - Potential partner for the HSD regarding Social Housing units within the building (could potentially help develop units as well).
- NU (<https://nu.org.za>)
 - Ndifuna Ukwazi
 - NGO that advocates to promote more spatial equality
 - “We advocate for a more equal, spatially just and inclusive city by protecting and expanding access to well-located land and affordable housing.” (NU, 2022)
 - Could partner with the HSD in ensuring low-income residents are truly socially integrated in the model.

Appendix C: List of Interview Participants

Interviewee Occupation	Date of Interview
Architect	October 31, 2022
NASHO Representative/ Urban Planner	November 3, 2022
Civil Engineer	November 4, 2022
Duke Gumede, HSD Representative	November 7, 2022 and December 5, 2022
DAG Representative	November 11, 2022
NU Representative	November 18, 2022
Real Estate Agent (marketing expert)	November 29, 2022
NHFC Representative (finance expert)	November 29, 2022

* All interviewees have agreed to be cited within this document. No identifying factors were shown in order to maintain confidentiality. The only interviewee who was personally cited was Mr. Duke Gumede, the project sponsor, who has consented to being identified.