ILHA DO JOANEIRO

From living in the grey to living in colour

ILHA DO JOANEIRO

From living in the grey to living in colour

Universiteit Antwerpen

Design Studio ISTT
International Studies - Territories in Transition
Faculty of Design Sciences - Architecture
University of Antwerp
Supervisor: De Walsche Johan, Goethals Marleen

Vennekens Michelle
Antwerp, June 2020

Image cover:
Rua Nova, Ilha do Joaneiro

ACKNOWLEDGEMENTS

Foremost, I would like to express my sincere gratitude to my advisors Prof. Johan De Walsche and Prof. Marleen Goethals, from the University of Antwerp, for their continuous support of my research and design, their patience, motivation and immense knowledge. I also want to thank Lula Marcondes and Mucio Vasconcellos, both professors architecture and urbanism at UNICAP, for their great enthusiasm into social architecture, their encouragement, insightful comments, hard questions and for the warm welcome in Brazil. The guidance of all four professors helped me in all the time of research and writing of this thesis. I am grateful for the community leader, Marcone and the residents of Ilha do Joaneiro, especially Binha and her family for their kind reception and the help to understanding their lives. I want to thank the students of UNICAP for being a bridge between me and the families in the favela, for helping with translations and for offering me an amzing time during my stay in Brazil.

Finally, I must express my very profound gratitude to my parents, brother, sister and brother-in-law. And to my friends as well, for providing me with unfailing support and continuous encouragement throughout my many years of study and through the process of researching and writing this thesis. Thank you to Suzan, Veerle, Silvia and Erika for being my proofreaders, editors and translators. This accomplishment would not have been possible without all of you.

Thank you.

Michelle Vennekens

ABSTRACT

This research studies the transformation of the favela Ilha do Joaneiro in Recife, Brazil and provides possible strategies and pathways for socially sustainable development. The research focuses on the Rua Nova, a lively central street in which transformation will highly impact the living conditions of the entire community.

The International Studio 'Territories in Transition' includes an associated foreign internship in Brazil. In the framework of this master's thesis, with a fellow student from the University of Antwerp, we went and studied the favela district of Ilha do Joaneiro, located in the state of Recife, Pernambuco. A local workshop in cooperation with UNICAP inside the favela was the starting point for a design research. The purpose of this design research is to find solutions that will not only meet the needs of the residents, but also employ solutions that I consider essential in creating better living conditions for the entire district.

Ilha do Joaneiro has problems, but also opportunities. During this study, I tried to look at the problems starting from the existing situation and solve them in practical and sensible ways. This informal neighbourhood and the negative connotation associated with it, was tried to be overcome by making it accessible to all. Poor housing conditions, but well-kept streets, and the availability of facilities, creates a desire to start designing for the people by facilitating more public and open spaces.

The question asked during this research is how we could improve the living conditions in a favela by using efficient interventions techniques that mimic transformations that would have happened naturally. Through an extensive analysis following the workshop done in Brazil, a toolbox is set up for the community to use once they decide to make changes in the district. It includes interventions suggestions for the public space as well as interventions for private houses. All interventions are designed so that they can be used throughout the entire favela. This way, Ilha do Joaneiro can be transformed into a vibrant neighbourhood where safety is key and social interaction triumphs.

The motivation behind this master's work lies in the fact that an informal district should neither be reduced to being known as an unpleasant place as is done by so-called "outsiders", nor should the development happen ad hoc. Instead, it should evaluate the potential and enhance the small moments the favela district has to offer. This masters work wants to explore those opportunities and small moments in the development of the community.

The preliminary research "The community of Chié", completed in the thesis of the ISTT studio in 2019, is the basis of favela research and history on a macro, meso and micro scale. Chié is another favela in the center-city region of Ponte do Maduro, next to Campo Grande and therefore, it is very relevant for the 2020 ISTT project what this book describes. In this project, Brazil was first framed on a macro scale, followed by the current situation of Recife on a meso scale. Lastly, the favela district of Chié was described on a micro scale.

This book continues on the research done last year, but it focuses on a different part of the district, namely Ilha do Joaneiro. The first chapter contains an elementary introduction on favelas in Brazil and on a more micro scale, Ilha do Joaneiro. This book tries to provide solutions to the problems identified in the neighbourhood and residencies. In order to obtain a design research, a number of important calculated observations of the neighbourhood will be outlined in the second chapter. This way, the general image and possible solutions created using the field research, are introduced for each subject. The first impressions form the base for a design toolbox.

A third chapter consists of a toolbox shaped by the interventions done to accomplish urban transformation. A walk through the central street indicate a number of places that show a lot of potential. These problematic places are being resolved through a series of interventions. Although the interventions are perfectly possible separately, the appropriate combination and coherence of the different interventions is essential to reach the full potential of the community. The adaptations that take place in different areas interact with each other and will influence the entire neighbourhood. This book concludes with the fourth chapter that provides several recommendations for the residents and the community leader to use when a transformation takes place.

TABLE OF CONTENTS

PROLOGUE

This thesis is a research by design of the Brazilian favela Ilha do Joaneiro in Recife. The community, under supervision of the community leader Marcone, is a slum that still faces several problems when it comes to urban and architectural design. The favela shows a lot of potential because of certain actors, however, they need some guidance for the opportunities to reach their full potential. This thesis strives to be the first step in becoming the guide that they need to positively transform the favela, thus improving the quality of life.

TITLE EXPLAINED

From living in the grey to living in colour.

The title can be split apart in two sayings. First of all, we have 'living in the grey', secondly, we have 'living in colour' or 'in living colour'. Both expressions have dual definitions that are applicable in this thesis and the community.

" Living in the grey"

This expression indicates that you don't look at things in only black and white terms, but you live in the grey. Therefore, you're flexible and have an open mind for improvement. But living in the grey could also literally mean, living in a grey environment. Ilha do Joaneiro is fully paved and installing roads out of concrete or cobblestones to this day. Every surface is hard and an aerial view shows you this perpetual state of grey. Change is necessary.

"Living in colour"

We can choose positivity and see it in colour, or we can choose negativity and live in a perpetual storm of grey. We can live a positive life by living in colour. We just need to open our eyes to the possibilities.

It means living life to the fullest and getting the most out of life. But it also means that the new design requests interventions with new materials and textures, literally more colour. By trying to introduce additional green infrastructure, the interventions should bring more people out to the streets. This way they would become part of the vibrant street life, causing a colourful display from above.

► Image 01
Street TV· Ledinha· Ilha do Joaneiro

CHAPTER

I

INTRODUCTION

I INTRODUCTION

RESEARCH CONTEXT: ISTT

This thesis is part of the International Studio: Territories in Transition, and focuses on design and research methods to study and improve specific vulnerable areas. This is the second year the studio took part in the workshop in collaboration with the Catholic University UNICAP. The workshop took place in a local slum area, Ilha do Joaneiro. With this studio and workshop, we find ourselves in an unfamiliar environment, which requires a modified design research method. The level of difficulty lies in the cultural differences, and how we have to adjust our design tools to this present globalization. These difficulties are also an opportunity to discover new methods and techniques, which can hopefully be implemented by other territories in transition.

Under supervision of Johan De Walsche, Marleen Goethals, and Dirk Laporte, the interdisciplinary studio is organized by the Faculty of Design Sciences at the University of Antwerp. Our research is in collaboration with the Catholic University of Pernambuco (UNICAP) in Recife. In the care of Lula Marcondes and Mucio Vasconcellos, both professors of architecture and urbanism at UNICAP. Anna, a fellow student and I enlisted the help of Brazilian students who volunteer at the lab for social architecture. They assisted us in communicating with the inhabitants and community leader, translating documents, and guiding us through the community of Ilha do Joaneiro. Our stay in Brazil consisted of a workshop week, followed by our own local research of the favela Ilha do Joaneiro including essential interviews and conversations with the inhabitants.

◀ Image 02
Waste management Ilha do Joaneiro

TOPIC OF TRANSITION: FAVELAS IN BRAZIL

A favela in Brazil is an informal neighbourhood that emerged from an unmet need for affordable housing, most often on the periphery of larger cities.[1] They are established and developed by individual residents without any governmental regulation. These informal settlements are characterized by a high-density area with mostly low-rise buildings where a majority of favela homes are built of brick, concrete, and reinforced steel and finished with tiles and tiled floors. Most residents spent years upon years of physical labour and decades-worth of income into constructing their homes. However, the community evolves continuously based on the culture and access they have to resources, jobs and knowledge.

There is a wide variety of neighbourhoods, from more slum-like settlements, to highly-functioning communities. Another characteristic is the variety of small businesses that serve the needs of the community. But the favelas are also frequently crime-ridden, and experience a high degree of drug trafficking. Favelas often emerge in response to urban migration. This is coupled with the inability of cities to absorb population growth or provide affordable housing and adequate services within a planned urban framework. Over the past few years, the Brazilian government has taken multiple approaches to dealing with favelas to provide or improve infrastructure and permanent housing. [2]

[1] Wallenfeldt, J. (2019, 22 augustus). *Favela | Definition, History, & Facts.*

[2] Catalytic Communities. (n.d.). *Call them Favelas.*

Importance of infrastructure and streets

While informal settlements are integral to the overall economy and livelihood of many cities, they are often spatially segregated and disconnected due to the absence of infrastructure. A lack of streets and open space that connect them to their surroundings can make the provision of basic services almost impossible. As people continue to move to urban areas in search of jobs, there will be opportunities to ensure that the design of streets in new and existing settlements become a means for promoting strong, safe communities.

Importance of an actor-oriented process

We should work with local communities on strategies to invest in the provision of local utilities, safe environments for walking and cycling, and increased access for the public, and emergency services.[3] The street can play a critical role in providing services for residents of informal neighbourhoods, while minimizing displacement, and improving overall connectivity and quality of life.

[3] Haas, G. (2010, July 5). *James Rojas: The City as Play*

CASE STUDY: ILHA DO JOANEIRO

CONTEXT

This thesis will focus on the favela district Ilha do Joaneiro, located in Recife; a city in northeast Brazil. The center-city region of Ponte do Maduro, is an area of informal settlements consisting of four communities (Santo Amaro, Santa Teresinha, Chié and Ilha de Joaneiro) with upwards of 55,000 inhabitants. Ilha do Joaneiro is a slum part of Campo Grando, west of Chié and bordering on Torreo. The structures in the community differ in age but have grown over the century. Going from paliphita´s, or stilted wooden structures, hovering over the former wetlands, into durable one and two storey buildings made using more permanent materials on paved ground. The expansiveness, the range of services and local businesses, the networks of electricity and running water in most houses, are all evidence of the hard work done by the community leaders to provide basic services to residents.[1]

Ilha do Joaneiro is integrated into the urban fabric in such a way that it has the most desirable location for becoming incorporated within the city. The community is situated on one of the main traffic junctions in Recife, the Avenida Governador Agamenon Magalhaes. This creates a connection with the urban fabric of Olinda. Due to this bustling street, Ilha do Joaneiro benefits from the availability of public transport. However, on a smaller scale the connection with the surrounding neighbourhoods is a problem. The busy intersection divides the areas, which make them difficult to reach. The local people can't walk in a practical or safe way to Santo Amaro or the Tacaruna shopping centre.[2]

Ilha do Joaneiro is an informal neighbourhood characterized by a high density area with buildings restricted to mostly two levels. Bricks and concrete are commonly used materials for the homes as well as

[1] Pritchett, R. (2011). *Land titling as women's empowerment: Critical observations from Recife Brazil.*

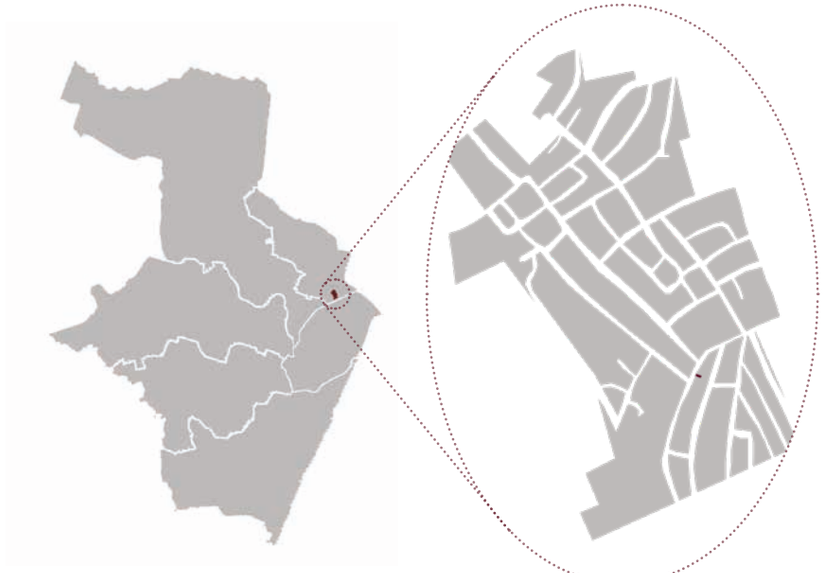
[2] De Baere, M., De Smet, E., Eyckerman, M., Pellens, B., Dierckx, S., & Vanhoutte, L. (2019). *Special Zone of Social Interest, The community of Chié.*

pavement. Informal urban areas, such as Ilha do Joaneiro, form a large portion of the built fabric in the city of Recife. Ilha do Joaneiro can be seen as an adequately functioning community with a small variety of local businesses due to the presence of most utilities and the hard work of the community leader to maintain the good condition of the community. The presence of an involved community leader, construction workers, and a social gathering, makes Ilha do Joaneiro a community with lots of opportunities to be used as a case study.

▲Image 03: map of Brazil
Area: 8.516.000 km²
Population: 207,7 million people
Capital: Brasilia

▲Image 04: map of Pernambuco
Area: 98.312 km²
Population: 9,278 million people
Capital: Recife

▲Image 05: map of Recife
Area: 218 km²
Population: 1,555 million people



▲Image 06: map of Ilha do Joaneiro
Area: 154,42 m²
Population: estimated 6735 - 9000 people

AIM

The aim of this research by design is to create clarity for the residents on how they can intervene during transformations that would take place. It is trying to find a toolbox to be used during that time of transformation to improve the quality of life of the community. This toolbox can be used as a device to make the community more vibrant and accessible to all. Improving the living conditions by changing the street design and making architectural interventions, attracts people from the surrounding areas .This will respectfully impact the use of the existing infrastructure of the Avenida Governador Agamenon Magalhaes.

This toolbox for an improved urban street is seeking to make an impact by resolving the demands of more people than they do today. It must be designed to support the multiple challenges the community faces, and it should also contribute to several goals as well. Goals such as: public health and safety, the quality of life, environmental and economic sustainability, and social equity.

PROBLEM STATEMENT

The challenges of living in a favela include a dense area where residents are being plagued with problems associated with poverty. There is a lack of education, health, legal electricity, and proper waste management in the community. The absence of physical resources and knowledge restricts the residents from investing in their houses. An unsafe feeling prevents people from going out at night, diminishes social interaction , and increases the already high crime rate.

So what resources are necessary to improve the living conditions? How can this thesis serve the residents in their search for improvement? Which architectural interventions can be done to invest in better housing? When should this thesis intervene? Which interventions on an urban level can be done? When can this thesis intervene in the public space? What place should the community leader take in these interventions? Which actors are necessary for each intervention? How do the urban and architectural transformations intertwine? What is the effect of the thesis as a guide to these transformations? An answer to all these questions is tried to be found in this research.

▲Image 07
map of Ponte do Maduro

METHODOLOGY

To find answers on the different research questions, multiple methods and actions are required. An analytical framework and a field research with actor-oriented workshops, interviews, spatial analyses and observations, are means to successfully collect data and process within the design research. These used methods and actions are described below.

Workshop

The workshop is a useful tool to do research. Throughout the workshop, a first impression of how a favela functions is made. Contacts are made and you get acquainted with a different culture. By working together with students from UNICAP, different methods are explored and new knowledge is gathered to use during the research. The workshop serves as a bridge between students and residents, involving both parties in the process. This ensures a certain amount of pride in the residents, improving the end result.

Field research

Following the workshop, field research was done. The field research was one of the main methods used to conduct research. One of the two prominent methods used to gain insight in the social structure of the community was through interviews. A lot of interviews of people of various ages were carried out in order to get broad and varied information. These interviews were based upon interview forms (see annex) that we made in advance, which were later translated into Portuguese by a Brazilian student. By interviewing different groups of people, you get different perspectives on a variety of topics such as social life, habits, and which places are considered dangerous or safe. Residents were asked about how they experienced life in the favela. How much do they go outside, where they go, where the children play, wether they feel safe, etcetera. However, not all the information gained from interviews can be accepted as facts, we have to deal with it critically.

On top of this, we also made a lot of observations of life on the street and life inside the homes. By walking around the favela, we could see how people behave on the streets and we met with some people who opened up their homes to show how they live. Further analysis consists of plans, diagrams, and drawings based on the observation of the community.

Case studies

By thoroughly studying specific cases, a lot of information can be acquired on the daily lives of residents. It is very useful to compare these cases with each other in order to gain a broad perspective on life within the houses. For this research, six specific houses were visited and measured. These case studies serve as a starting point to how transformations and interventions can be done without causing the inhabitant to leave the safety of their homes. Drawing the floor plans of the houses after measuring them, was a useful tool to compare the different houses. It offered insight on the density of people per dwelling, the available space per person, the resources available to the different people, and the needs each family has.

Analysis and mapping

The research follows the observation done in the favela. The analysis or process of breaking down the community into its physical, mental, and social characteristics teach us what they do and how they relate to one another. The motivation to develop an architectural solution is to both address and improve these factors. This results in an extensive identification of the problems and opportunities in the neighbourhood. The analysis consists of two prominent parts, a theoretical framework and a conceptual framework.

Part of the research is mapping and goes hand in hand with the analysis. Mapping is a good method to visualize the analysis that was made. This method helps to structure the data and links it to the geographical terrain. Some results can be grouped, which form a cluster of maps, others result in a diffuse spread of data. The concentration of different data in the same place can be related, it's our task to investigate in these possible connections. For example, the height of the buildings, the location of the trees, concentration of social interaction, and the infrastructure were mapped.

Design proposal

In research by design, design is a significant part of the research process. The design process then forms a pathway through which new insight, knowledge, and practices are discovered.[1] The design proposal is the result of that creative process of identifying the needs of the community and how to fulfill those needs. Lastly, the design needs to succinctly be communicated to the community leader and the residents of the community for the design proposal to succeed.

[1] Roggema, R. (2016). *Research by Design: Proposition for a Methodological Approach*

All general information regarding the preliminary research done on the history and characteristics of favelas in Brazil can be found in the Atlas: "The community of Chié".[2]

[2] De Baere, M., De Smet, E., Eyckerman, M., Pellens, B., Dierckx, S., & Vanhoutte, L. (2019). *Special Zone of Social Interest, The community of Chié.*

CHAPTER II

ANALYSIS & DESIGN RESEARCH

II ANALYSIS & DESIGN RESEARCH

The design research was started after the workshop done in Brazil, this will be explained first. Then this chapter holds eight different subjects chosen after observing the community and its needs. Each part plays a role in either urban street design or architectural transformations. Through these subjects, a proposal to improve street design is introduced for the central street, Rua Nova. Each subject contains a part research through analysis and a part research by design.

It starts with the density (1) on several levels of urbanity to get a clearer understanding of the balance between population and space. Secondly the current functions (2)of the ground floor spaces are explored and enhanced through an improved mix of applications. Afterwards, there is a section analyzing the heights (3) of the buildings and the shadows they provide. This segment tries to find the best possible solution to maximize shadow, without creating an urban street canyon.

The fourth part is about the quality of life (4) through safety, mobility, and utilities and infrastructure. Fifth, there is an extensive instalment about green infrastructure (5). An analysis has been done about street trees, heat absorption of different materials, and vertical gardens. This continues in the next segment about adjusted street furniture (6) that incorporates greenery. Then the analysis is continued with the section about housing typologies (7). This part builds up to the possible transformations that can be used in the new design. This chapter is concluded with a part about different possible scenarios (8) that could happen during the development of the community.

Image 08 (previous page)
Street Rua Pedro Célso
◀Image 09
Narrow street in center of Ilha do Joaneiro

WORKSHOP

The workshop that was done is part of the beginning of this research. Firstly, Mucio Vasconcellos, professor at UNICAP and partner-director of 'Z Arquitetura', gave an introducing lecture about Ilha do Joaneiro and its problems. Next, we went to the favela, accompanied by the professors and several students of UNICAP, to evaluate the neighbourhood. We met with the community leader and were introduced to our respective families who were going to be part of the project. After talking to the families and asking about their daily lives, and problems they experience, we got together to find the right solutions for our families. After an intense week of research and designing, we came up with a design that was presented and rated on feasibility by the community leader. Lastly, we proposed the design to the inhabitants, showing how they could improve their homes in different scenarios, based on available funds.

The biggest challenge was to think of small interventions which were possible to accomplish within three days. Six families took part in the workshop and opened up their homes for us. Problems faced in the respective houses were, damage due to a fire, hoarding problems, the lack of plumbing and running water, the absence of basic facilities, etcetera. For the house of Dona Binha, the most urgent problem to solve was space. Her family of eight lived in a space of approximately 24m^2. A solution at the end of the design part of the workshop was building a mezzanine in wood to open up space on the ground floor, while still being able to live in the house during the renovations. Changing the roof, a new layer of paint, and renovating low walls, were other possible interventions to improve living conditions. Problems in slum areas have multiple layers and require a phased approach where the most urgent problems get solved first. However, cooperating with Binha was a lot harder since she had an "all or nothing policy". This means we were not able to execute any of the interventions during the three construction days in the favela at the end of the workshop, because Binha did not allow it.

► Image 10
Activity on Rua Pedro Célso

01 DENSITY

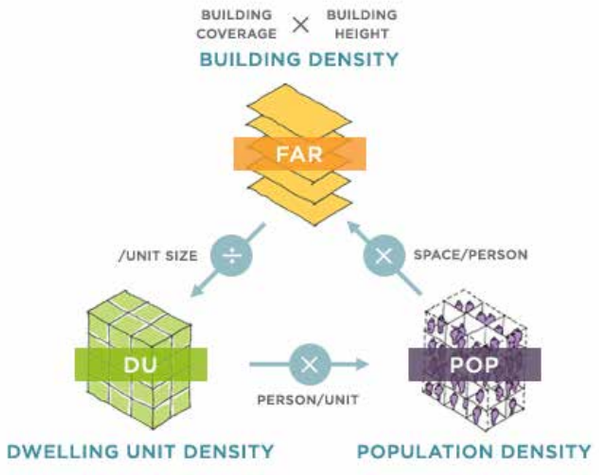


Image 11 ▶
Diagram three measures,
http://densityatlas.org/

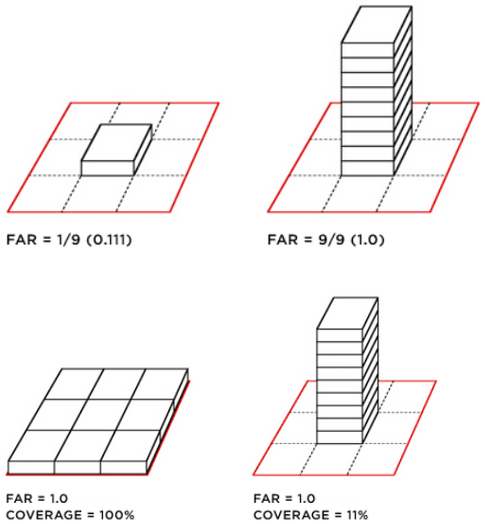


Image 12 ▶
Example diagram FAR,
http://densityatlas.org/

UNDERSTANDING DENSITY MEASURES

In this project, density is measured by three different quantitative measurements: floor area ratio, dwelling units per area, and people per area to provide an accurate understanding of the density. [1]

These three ways of measurement are the most common when it comes to density and each describes density from a different perspective. Each measurement looks at a different aspect of density and each measurement is used to plan for a specific set of needs. Although each measurement provides decent information about the neighbourhood, on their own, they do not paint a complete picture of the community's density.

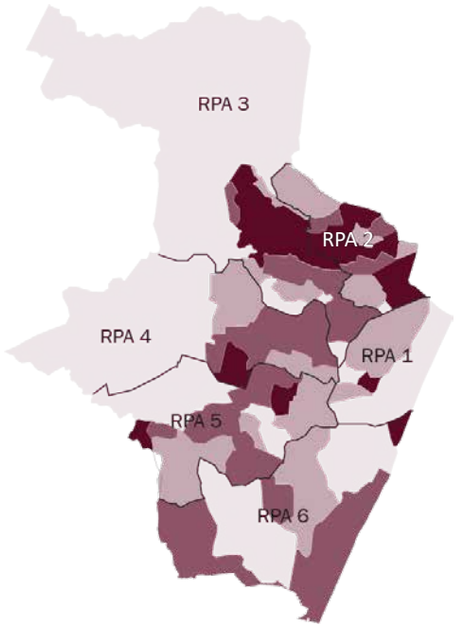
With the information provided by these three measurements, we also get a better understanding of the density by looking at them in relation to each other. For example, two communities may have the same number of people per household, but may feel more or less dense based on the relationship of the number of units to the number of people and the Floor Area Ratio (FAR) in the area.

The FAR is the ratio of built area to the area upon which the building is built. The coverage is the relationship between the ground floor area of enclosed buildings and the area of the lot. An example is when you have the same FAR but different coverage, this will result in different types of development concerning low-rise or high-rise. To illustrate this, a diagram is set up, using the example given by the website of densityatlas.org, seen on the left side page.

A second way to measure density is calculating the number of dwelling units built on the lot. The density in an area can change based on the number of dwelling units. This way a large building can take up the same amount of space, while having considerably more dwellings.

[1] MIT. (2011). *The Density Atlas*.

Regiao Politico Administrativa	Populaçao Residente				Densidade Demografica	
	(abs)	%	Domicilios	Area (ha)	(hab/ha)	(hab/dom)
Cidade do Recife	1.422.905	100,00	376.022	21.964,00	64,78	3,78
RPA 1 Centro	78.098	5.49	22.202	1.605,88	48,63	3,52
RPA 2 Norte	205.986	14.48	52.383	1.429,95	144,05	3,93
RPA 3 Noroeste	283.525	19.93	73.436	7.793,61	36,38	3,86
RPA 4 Oeste	253.015	17.78	67.486	4.214,13	60,04	3,75
RPA 5 Sudoeste	248.483	17.46	64.108	3.010,27	82,55	3,88
RPA 6 Sul	353.798	24.86	96.407	3.901,79	90,68	3,67



▶Image 13
Density per RPA;
Eyckerman, M., & Dierckx, S. (2019). *Chié, the revival of an informal district, p25*

The last way of measuring density can happen through measuring the number of people in an area. However, it is important to still figure out if the dwelling units would have a comfortable size, if there is public space present for people, or how many people per household are present.

Recife´s informal settlements are something different then Rio´s, stacked houses are renowned for sprawling up the hills, encircling the city. Recife´s favelas are scattered like patchwork throughout the city. The favelas line riverbanks and curb the shadows of tall, gated apartment buildings. However, 62 percent of Recife's 3.7 million residents living in the metropolitan area, are described as informal. Meaning, Recife houses the highest proportion of informal residents in Brazil, only being surpassed in population of informal residents by the two megacities of São Paulo and Rio de Janeiro. Therefore, formal neighbourhoods are more the exception than the rule. [1]

[1] Pritchett, R. (2011). *Land titling as women's empowerment: Critical observations from Recife Brazil.*

By Recife being the fifth most densely populated metropolitan area in Brazil, there is a large variation in density between different Political Administrative Regions or RPA (subdivisions of a metropolitan). Ilha do Joaneiro belongs to RPA 2 - Norte. This RPA has one of the highest population densities in Recife with approximately 14,405 inhabitants/ km^2. Also, within RPA 2 there is a large variation in density. Ilha do Joaneiro is located in an area where the population varies between 15,000 and 30,000 inhabitants per km^2. [2]

[2] Eyckerman, M., & Dierckx, S. (2019). *Chié, the revival of an informal district.*, 25

Campo Grande
Location: RPA: 2, Microregion: 2.1, Distance from Ground Zero (km) : 3.80
Territorial Area (hectare) : 222
Resident Population : 32,149 inhabitants

Population by age group	hab	%
4 years	2,147	6.68
5 - 14 years	4,859	15.11
15 - 17 years	1,569	4.88
18 - 24 years	3,906	12.15
25 - 59 years	15,609	48.56
60 years and over	4,059	12.63

Literacy rate of the population aged 10 and over (%) : 91.5
Average Geometric Rate of Annual Population Growth (2000/2010): 0.29%
Demographic Density (Inhabitant / Hectare): 145.04
Households (nº) : 9 554

- Average number of residents per household (Inhabitant / Household): 3.4
- Proportion of Women Responsible for the Home (%): 54.07

Special Areas of Social Interest in the neighborhood (Zeis): Ilha de Joaneiro and Campo Grande (part)

Brasilia Teimosa
Location : RPA: 6, Microregion: 6.1, Distance from Ground Zero (km) : 2.33
Territorial Area (hectare) : 61
Resident Population : 18,334 inhabitants

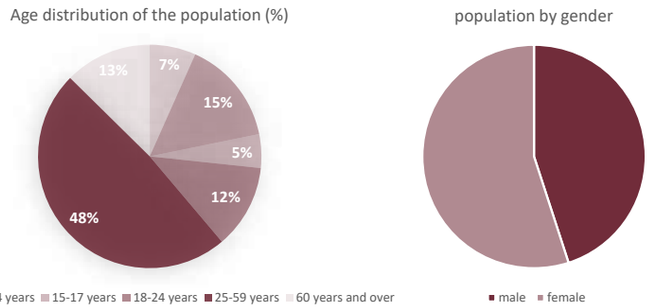
Population by age group	hab	%
4 years	1,285	7.01
5 - 14 years	2,854	10.55
15 - 17 years	907	3.82
18 - 24 years	2,156	11.28
25 - 59 years	9,084	52.89
60 years and over	2,048	16.49

Literacy rate of the population aged 10 and over (%) : 91.8
Average Geometric Rate of Annual Population Growth (2000 / (2010): -0.44%
Demographic Density (inhabitant / hectare): 302.81
Households (nº) : 5,464

- Average number of residents per household (inhabitant / household): 3.4
- Proportion of Women Responsible for the Home (%) 49.57

Special Areas of Social Interest in the neighborhood (Zeis): Brasília Teimosa (part).

source: https://www2.recife.pe.gov.br

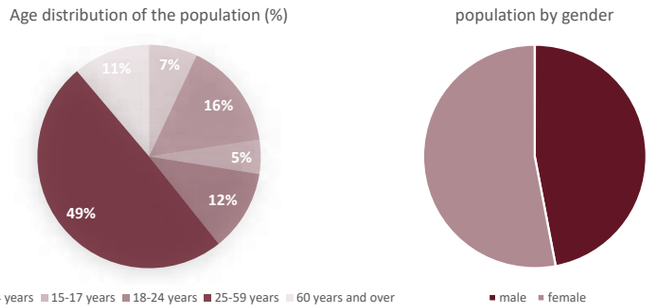


▶ Image 14
Residents per gender & per age, Campo Grande

MEASURING DENSITY

Understanding the relation between the three measurements will help to determine the best mix of these measurements for the community. The governmental website of Recife provides all numbers according to the different communities present in Recife. Looking at Campo Grande and Brasilia Teimosa, we can conclude that Campo Grande has a low population density, while Brasilia Teimosa has a high population density. However, it feels a lot more dense in Campo Grande than it does in Brasilia Teimosa. Planning and developing the community of Ilha do Joaneiro, located in Campo Grande, has to be done appropriately to its cultural context. The feel of the place is dependent on the urban design features, coverage, open public space, the architecture, and street design. All these different factors will contribute to the feel of the area, but they are independent from the quantitative measuring of the density. [1]

[1] MIT. (2011). *The Density Atlas·*



▶ Image 15
Residents per gender per age, Brasilia Teimosa

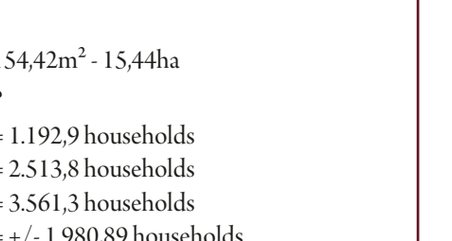
Ilha do Joaneiro

Area	154,42m² - 15,44ha
Number of households	?
218 households on 20,822.19 m² (2.082ha)	= 1.192,9 households
150 households on 9,214.31 m² (0.92ha)	= 2.513,8 households
39 households on 1,691.06 m² (0.16ha)	= 3.561,3 households
Average: 405 households on 3,172756ha	= +/- 1.980,89 households
Number of residents	?
1980.89 households *3.4 (inhabitant/household)	= 6.735
inhabitants, possibly more	= +/- 6735 - 9000 people
Average number of residents per household:	3.4 - 4.54
Demographic Density (Inhabitant / Hectare): 436,20	

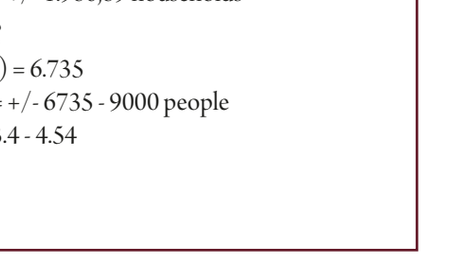
indicative units

FAR = 1/5 has a 2nd or 3rd level --> 0.81
coverage = 108.68m² built on 154.42m² = 0,7038 or 70%

FAR = 100% has a 4th level: 2,75
coverage = 108.68m² built on 154.42m² = 0.7038 or 70%
Average number of residents per household: 1.33



FAR = diversity in levels: 1,875
coverage = 57.56m² built on 154.42m² = 0.4375 or 44%
Average number of residents per household: 1.96

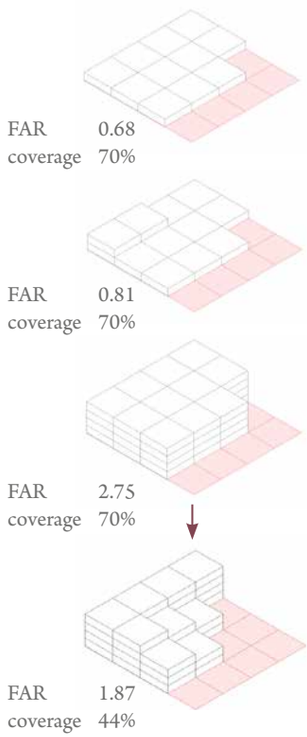


CASE STUDY ILHA DO JOANEIRO

◀Image 16
visual representation of the calculations on density in Ilha do Joaneiro

Ilha do Joaneiro is spread over an area a little over 15 hectares. The population is estimated between 6,700 and 9,000 people. There is an average of almost 2,000 households, resulting in an average number of 3.4 to 4.54 people per household. Ilha do Joaneiro counts a rather high demographic density compared to other surrounding communities with a rather low FAR, but a high build percentage (coverage).

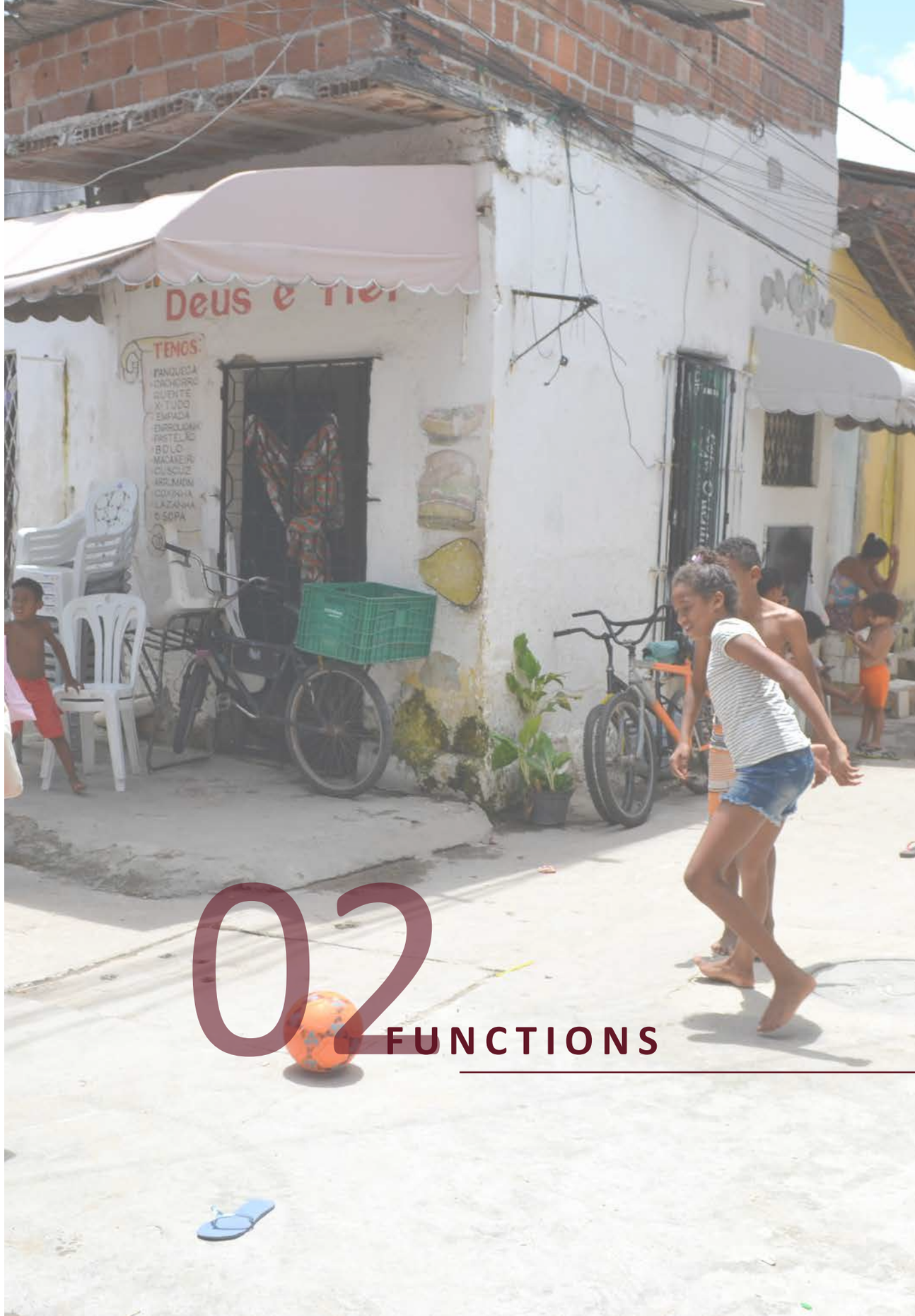
▼Image 17
Diagrams FAR & coverage



This could work to the advantage of the community. Because of the underdeveloped current state of the favela, there is a bigger opportunity for transformations. Instead of heavily densifying all building blocks, the opportunity rises to free more open space. By relocating families to new dwellings in the neighbourhood, old dwellings can be used to transform into gardens or social gathering spaces depending on the need of the community, as illustrated on the left.

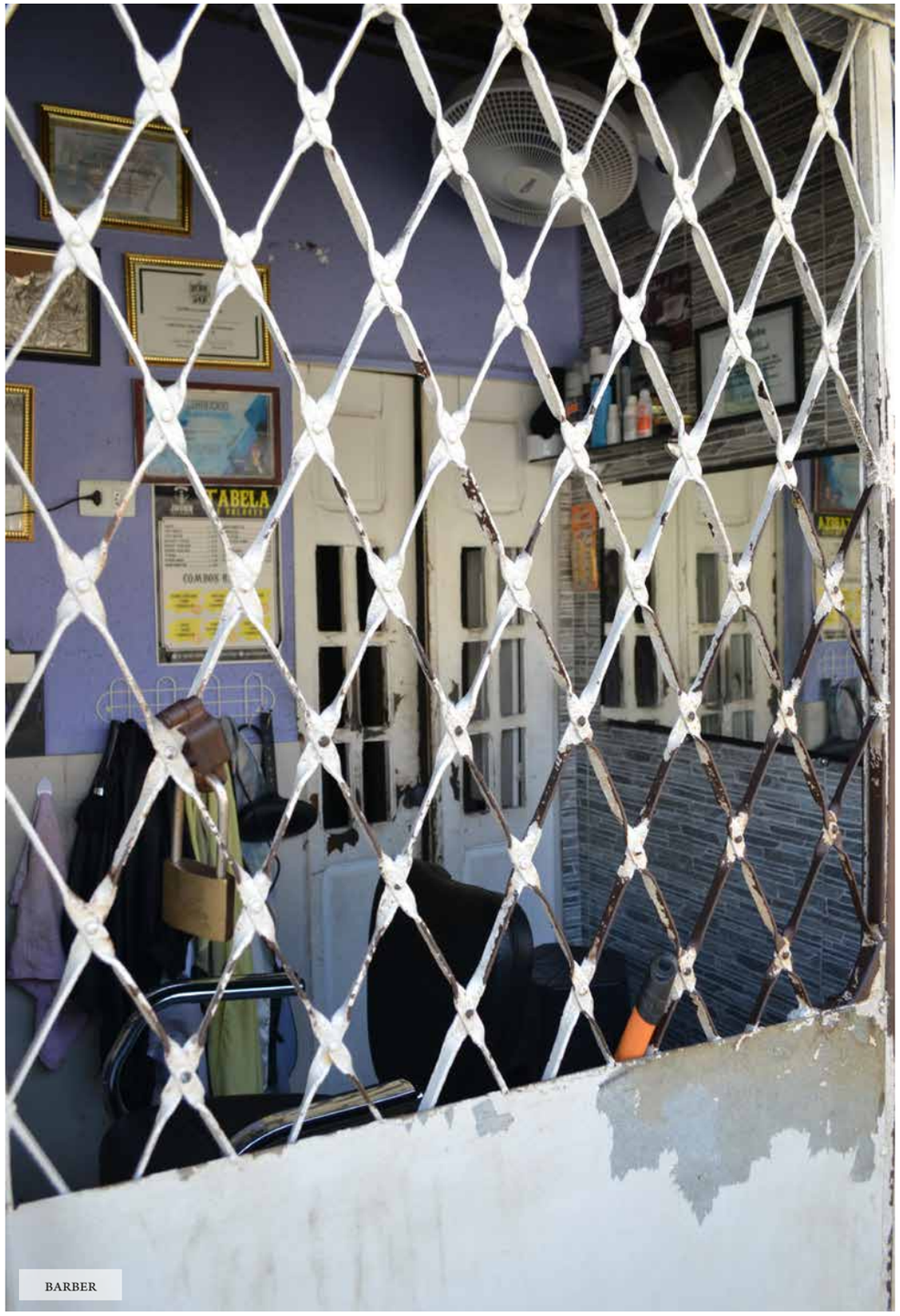
CONCLUSION

The situation in Ilha do Joaneiro today is too dense. People live on top of each other feeling restricted in their private lives. They ask for more space to live, and for more space for commercial services. Therefore, the toolbox should work towards a design with a decreased density level per dwelling. The population should be more spread out, creating more available m² per person. Each resident gets more open space, either public or private, creating the feeling of a less dense area. This will create more interaction between different residents and their families and it will need the community leader to act as a mediator.



02 FUNCTIONS

►Image 18
Activity at crossing in the center of the favela, Ilha do Joaneiro



▲Image 19
Construction worker on the Rua Nova

▲Image 20
Bar in the middle of the favela of Ilha do Joaneiro

◀Image 21
Barber in the streets of Ilha do Joaneiro

LOCAL CONTEXT

The street design plays an important role in enabling access to (in-) formal commerce, jobs, and the movement of goods. Therefore, a street should be designed to function as an economy.[1] A well-designed street creates an environment that entices people to stay and spend more time there. This generates higher revenues for businesses and in turn creates higher values for homeowners. A safe, vibrant, and efficient street is essential to the economic health of a community. The street design will play a major role in facilitating formal and informal commerce. If we look at work and productivity in the community, a significant number of human working hours are lost as a result of time spent in traffic towards the city centre. These lost hours result in reduced productivity and therefore economic losses. Furthermore, pedestrians and cyclists spend more money at local retail businesses than people who drive cars, underscoring the importance of offering attractive, safe spaces for pedestrians and cyclists. The redesigning of the street into a shared street would also add value to the neighbourhood. Shared streets focus on pedestrians. Designs may vary based on local context, but often curbs are removed and the materials and space allocation indicate that vehicles are guests.

[1] Global Designing Cities Initiative, & National Association of City Transportation Officials. (2016). *Global Street Design Guide*, 8-9

▲Image 22
Supermarket on the Rua Nova
▲Image 23
Supermarket on the Rua Nova
▲Image 24
Telecom service on the Rua Nova

SHAPING STREETS

The Rua Nova can be identified as one of the main streets of the community. The map on the left hand page indicates the mix of residential and commercial ground-floor uses that line each side of the street in a low-to-mid density context. The mix of uses consists of residential spaces, commercial spaces such as supermarkets or clothing stores, services as a hairdresser or a nail salon, and religious organizations such as churches. However, the commercial activity does not extend from the storefronts, as seen in the pictures above. This causes people to walk by rather than to engage. Therefore, a bigger and more extensive mix of uses between residential, commercial and services is needed to keep the space active and engaging throughout the day and evening.

◀Image 25
Map indicating the ground-level functions in the Rua Nova

COMMISSIONING UNUSED SPACES

Common in a favela is a family who rents out different floors of their house to other families or extended relatives. Those houses, located on the main street, tend to use the ground floor for commercial purposes. [1]

Due to people expanding their homes by adding more levels, ground floor spaces are being used as storage. The front door is being replaced by a staircase and facades are being closed off, resulting in an unsafe feeling in the street at night. Renting out these storage spaces for people to use as a commercial space or where they can practice their services, can result in a wider mix of ground floor uses and increases the feeling of safety of the street.

[1] Veysseyre, S. (2017, September 14). *Case Study: The Unspoken Rules of Favela Construction*.

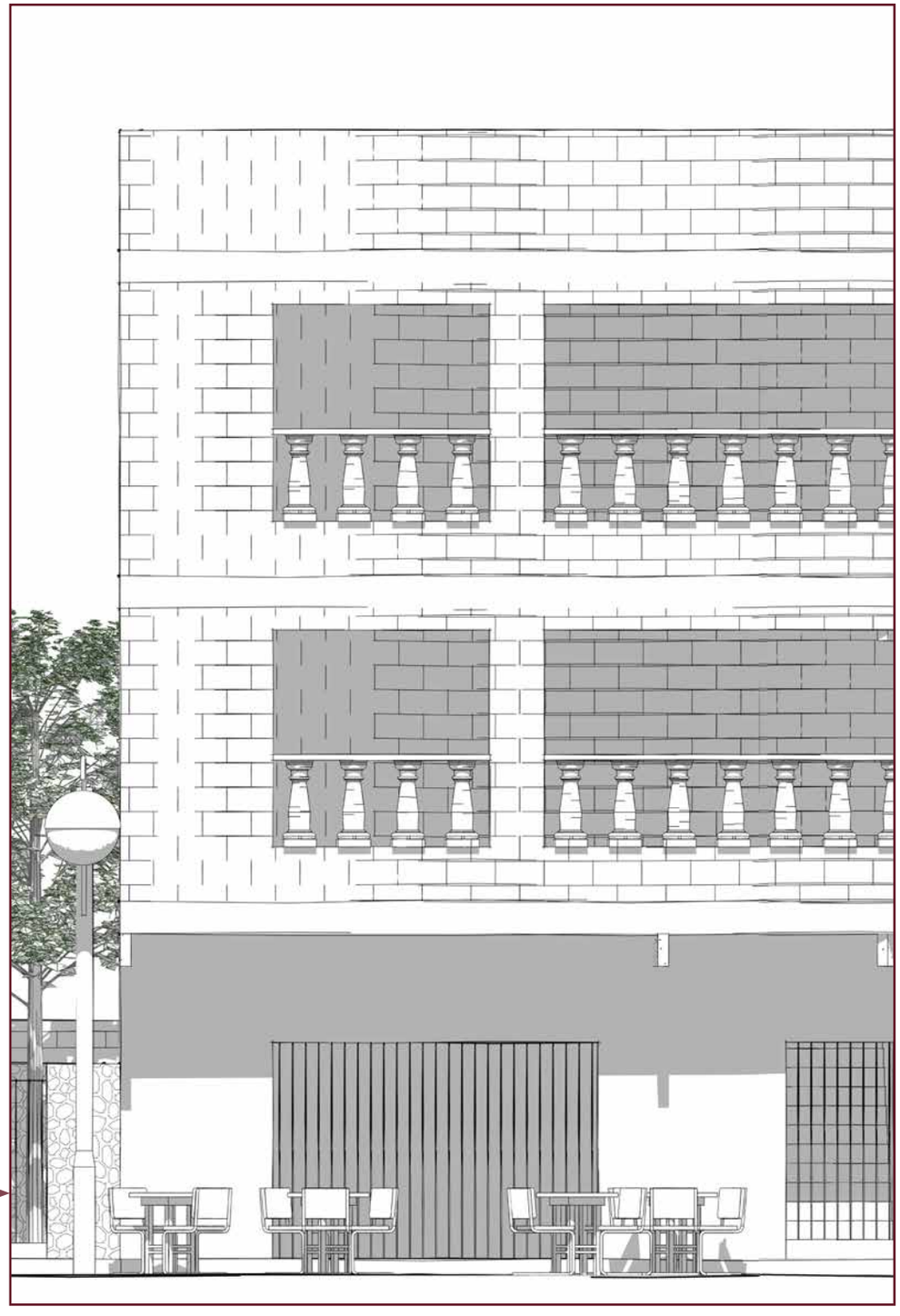


Image 26 (previous page)
Staircase after transformation, creating a blind facade

Image 27 (previous page)
Staircase after transformation, creating a blind facade

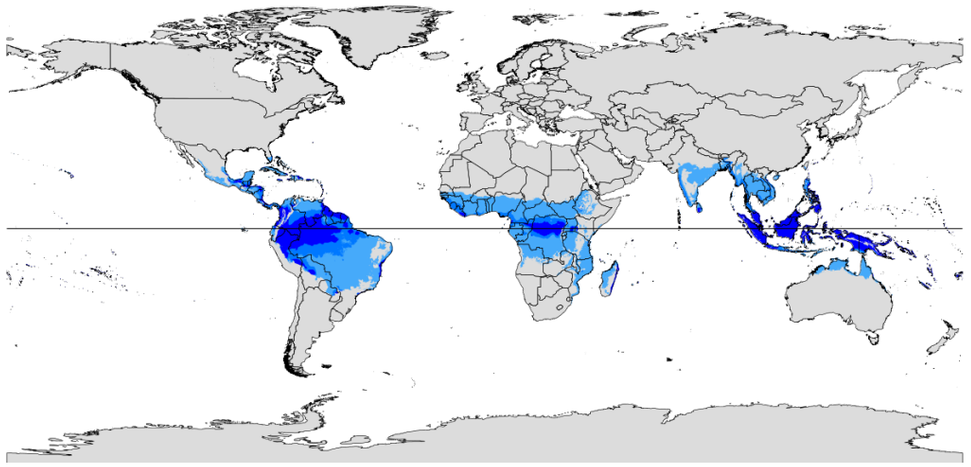
Image 28 (previous page)
Staircase after transformation and empty space used as storage, creating a blind facade

Image 29 (previous page)
Possible solution: commissioning non-used spaces

▶Image 30
Rua Lagoa Seca

03 HEIGHTS & SHADOWS

◀Image 32
Picture in Ilha do Joaneiro taken in October 2019.

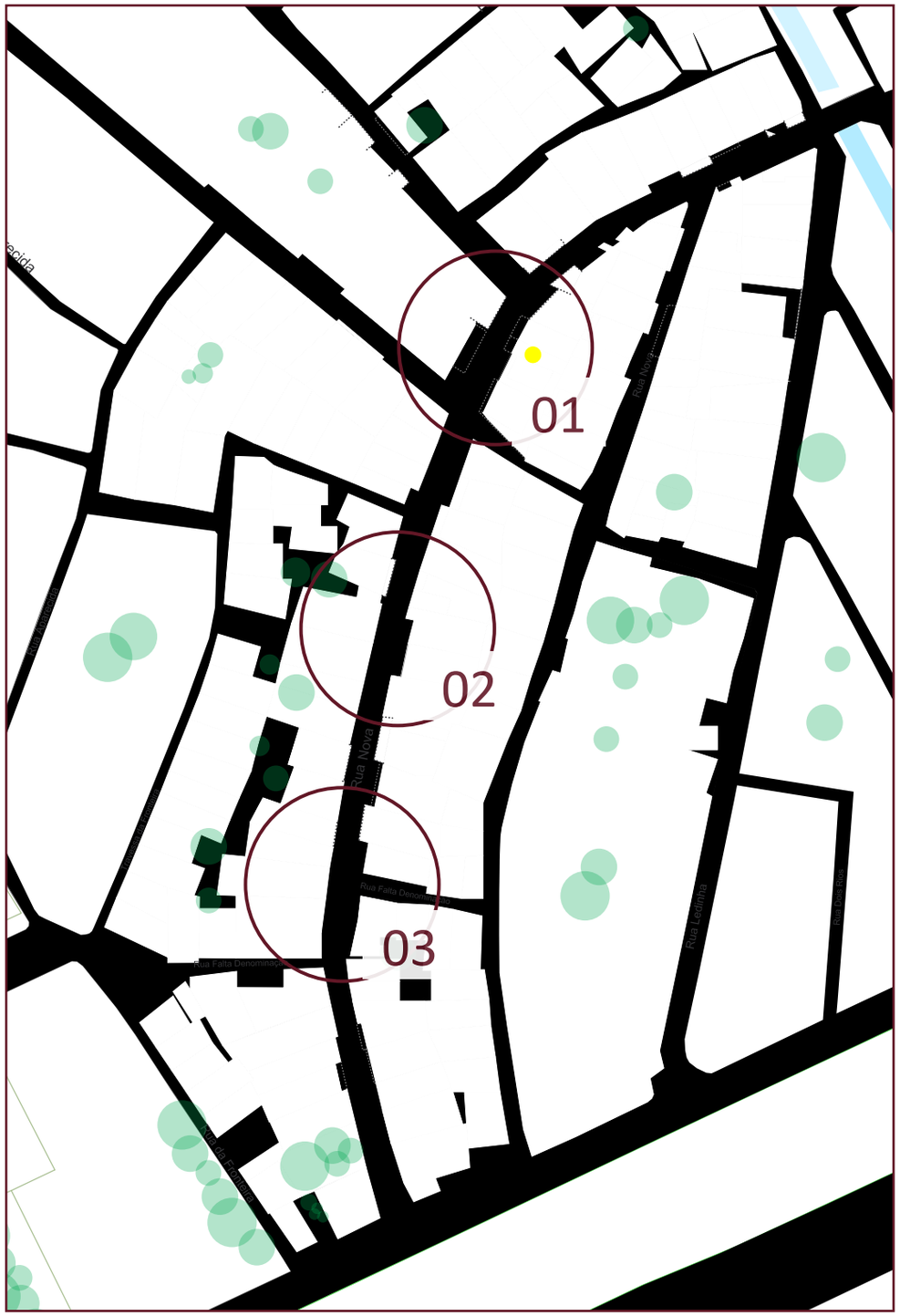


▲Image 31
Worldmap indicating the tropical climate, https://en.wikipedia.org/wiki/Tropical_climate

CLIMATE

Recife lies about 8m above sea level, Ilha do Joaneiro about 3m and has a tropical monsoon climate. The climate in Recife is hot, humid, windy, and partly cloudy. Over the course of a year, the temperature typically varies from 22°C to 31°C.[1] The warmest months are January, February, and December, the coldest and the months with the most rainfall are June, July, and August. The average hours of sunshine lies between 5 and 9 hours, causing a high need for shade to sit outside, and decent ventilation to cool down the houses in the community. That is why research has to be done regarding the incorporation of awnings and canopies on building facades. Protection from the weather such as rain or extreme heat should be offered in the form of practical added shelter. Another option for shade could be the installation of stand-alone shade structures or shade trees where possible.

[1] Merkel, A. (n.d.). *Recife Climate (Brazil).*



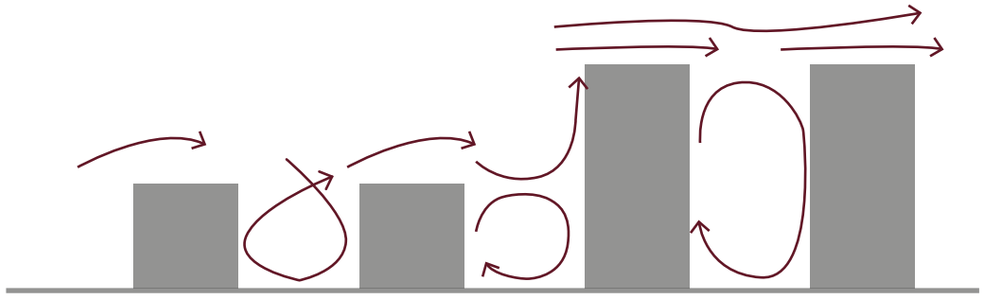
◀Image 36
Map of a reversed nolli plan, indicating the open public space and the three zones of interest

▲Image 33
Crossroad halfway the Rua Nova
▲Image 34
Thinner part of the Rua Nova
▲Image 35
Crossroad at the entrance of the Rua Nova

ONE STREET, THREE ZONES

This project focuses on one street, the Rua Nova, which connects through three different contexts. Context plays a factor in designing the street. Density, land use, and travel characteristics can shift as the street traverses through the community. The future design should respond to and reflect the desired character of the environment. As the needs and uses along a street change, street designs should respond and adjust accordingly.

The different zones in the Rua Nova are based on the changing amount of available public space and are indicated as in the image on the left page. Firstly, the intersection in the north part of the street is a lot wider than elsewhere. It has the vibe of a plaza but does not have the facilities to have the purpose of a plaza. Secondly, can the middle part of the street act as a gallery due to it being the smallest part of the street. Lastly, the intersection in the south of the street opens back up a bit, becoming the entrance of the shopping street. The use of the available public space goes hand in hand with the heights of buildings and the presence of shadow, as will be studied in this segment.



▲Image 37
Graphic showing the air-flow within an urban street canyon

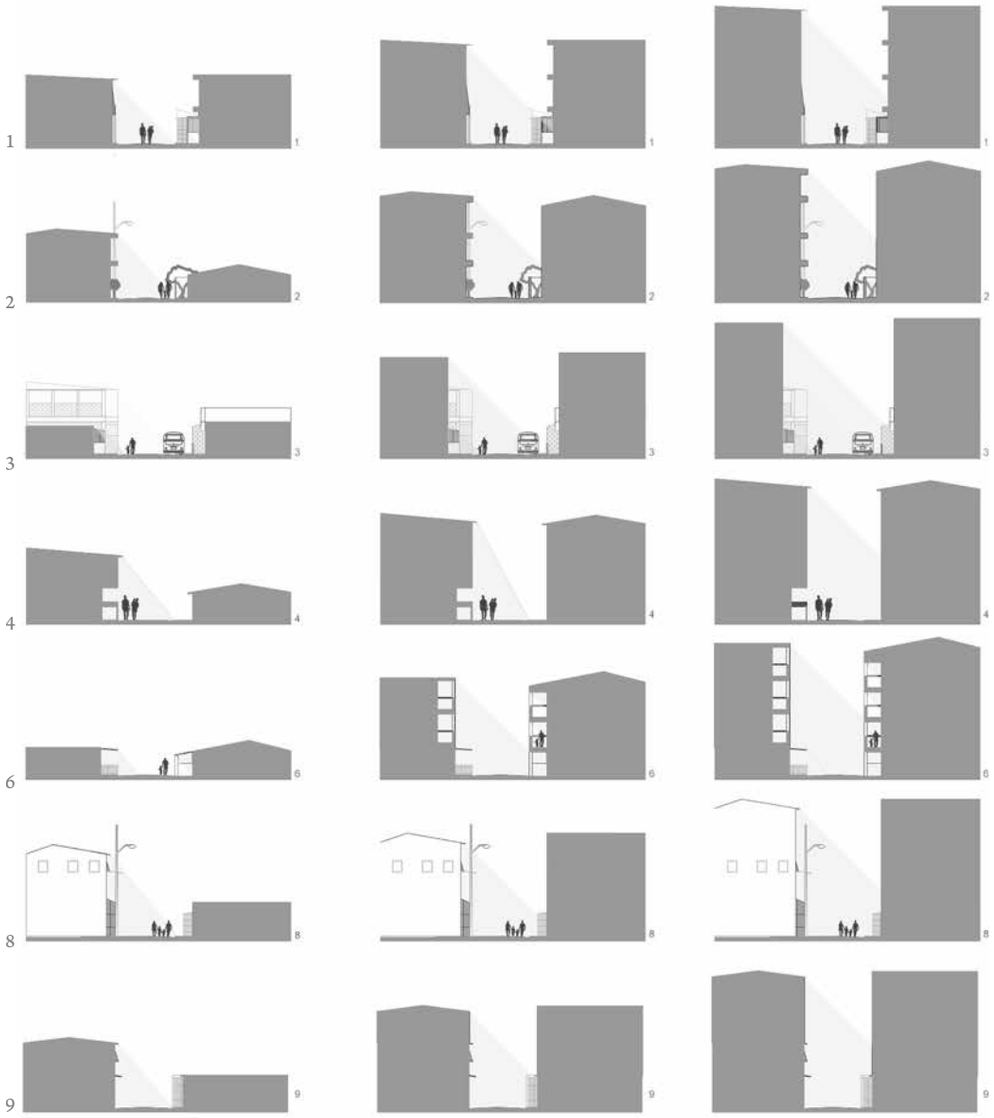
URBAN STREET CANYON

The definition of the curved street in relation with the height of the existing houses brings a strong sense of enclosure. As seen left on the map, more houses on the left side of the street consist of two building levels compared to the opposite side of the street. The current urban canyon ratio is around 0.5, this results in weak airflow that does not provide enough ventilation and as such has no cooling effect in the street.[1]

Upping the number of levels on both sides of the street could provide more shade throughout the different times of the day and increase the airflow. However, the added levels should not block the natural light entering the houses during the day. Adding levels to both sides of the street improves the urban canyon. Although, the ratio of height and width should be considered to ensure they are properly balanced. The effect of a street canyon on local wind and air quality will greatly differ in different sections of the street.

[1]Wikipedia contributors. (2020, April 11). *Urban canyon.*

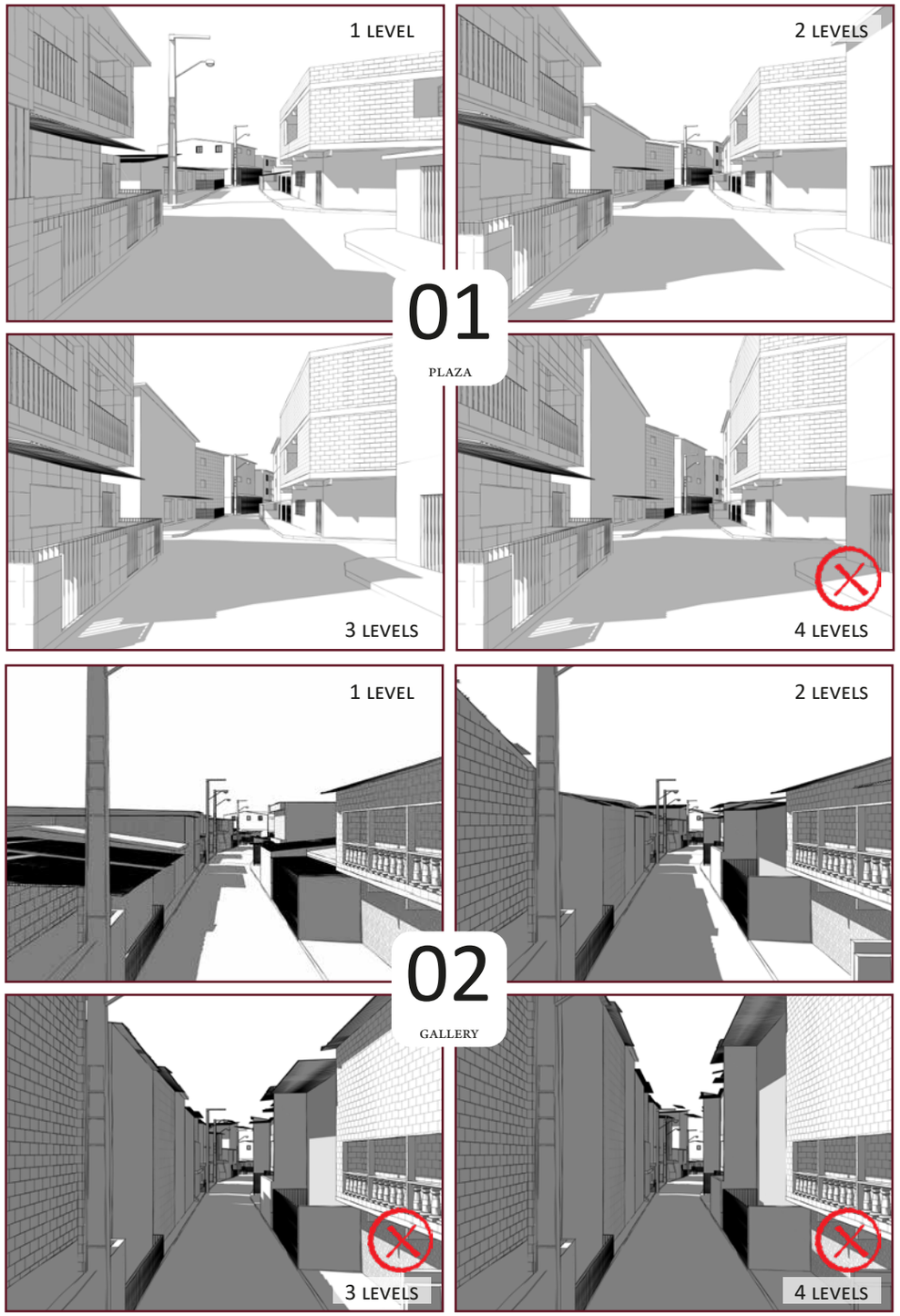
◀Image 38
Map of the heights of the houses in Ilha do Joaneiro in their current state



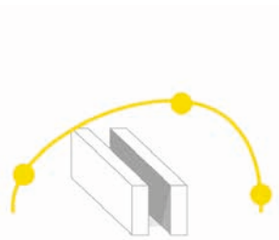
▲ Image 39
Street sections taken on the Rua Nova analysing the urban street canyon

◀ Image 40
Map of street sections taken on the Rua Nova

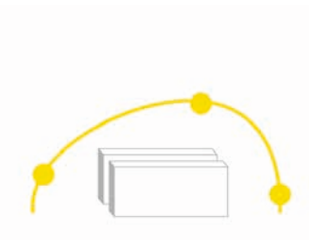
This page contains different street sections that indicate the urban street canyon and the shade provided by the height of the buildings and the width of the street. Adding levels provide a different feeling depending on the perspective. This was one of the methods used to determine the different heights possible in the Rua Nova.



▲Image 41
Map of the Rua Nova



▲Image 42
Representation sun position in a N-S oriented street



▲Image 43
Representation sun position in a E-W oriented street

The street sections indicate two possible scenarios. What if we raise the levels to three levels high with an average height of 9m, or what if it is raised to four levels (+/-12m)? The first scenario is much more favourable in the sense of the urban canyon ratio.[1] With a width of 8m, the ratio equals almost 1 and is classified as a regular canyon. This causes the wind to flow unhindered through the street, dispersing air pollution thus improving the air quality. The second scenario has a ratio of a deep canyon and a wind perpendicular to the canyon, confining the air flow and is therefore, less favourable.

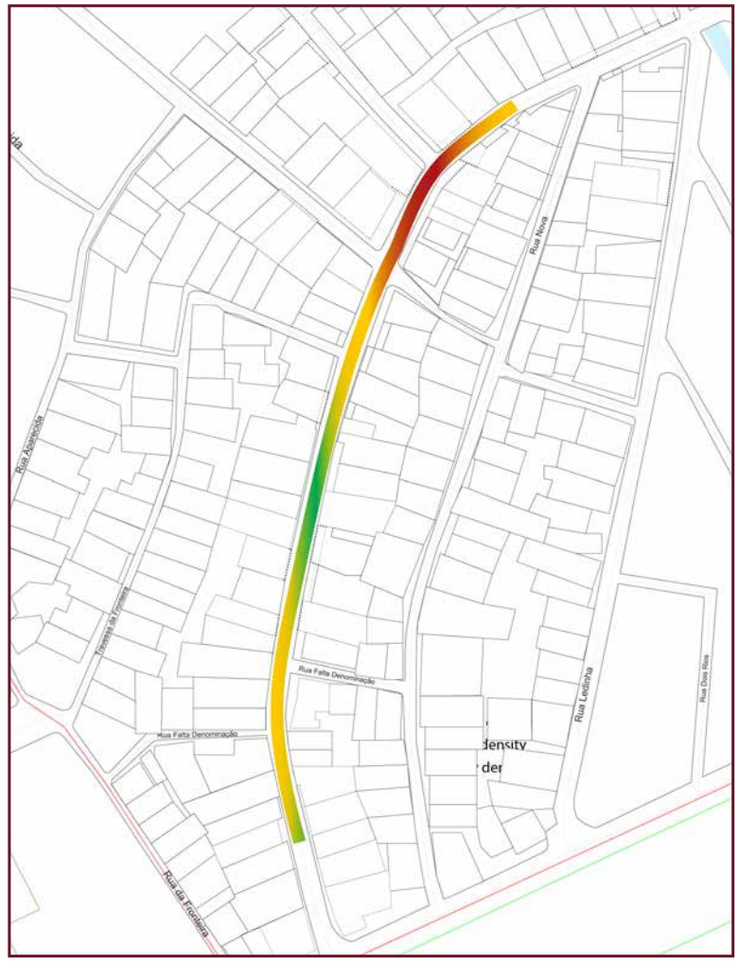
Thus, the width of each zone of the street will have an impact on the urban canyon ratio. In the context of the plaza, without taking necessary building permits into account, we could build up to almost four levels, while the gallery does not allow more than three levels. The entrance has a completely different vibe, and even though the street opens up again, no more than three levels should be built in this part of the street.

However, regulations on building heights restrict people in this community from building higher than three levels. Four levels require an elevator and a permit from the city. Also, the knowledge and capability to build up to four levels is missing. Therefore, all buildings are restricted to three levels with a roof terrace on top.

In this north-south oriented street, mornings are characterized by shade provided by the houses on the right hand side. Midday almost knows no shade due to the geography of Recife, a solution should be sought to provide more shade. The afternoon is defined by shade coming from the houses on the left. This creates shade during the hottest time of the day, and is a big advantage that can be used as an opportunity in future developments. An east-west oriented street has less opportunity to enjoy shade in the street. When the sun goes from east to west, these streets experience an almost continuous state of full sunshine.

[1]Wikipedia contributors. (2020, April 11). *Urban canyon.*

◀Image 44
Analysis on shadowing by building levels



▶ Image 45
Diagram on the densification in relationship with the building levels

However, another factor that plays an important part in defining the height of the buildings is the required density for the street. Starting from a case study on the plaza, a family of eight occupies a space of a little over 24m^2. This part of the street definitely asks for more dwelling units to give the people living there more room to live.

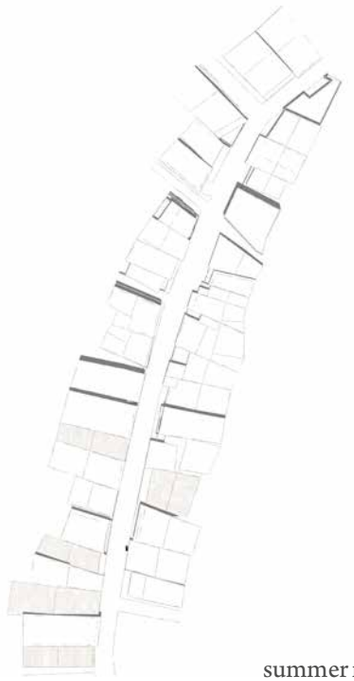
Because of the presence of multi-level buildings in the gallery, this part of the street does not require such enhanced changes in densification. Therefore, a diagram was made, showing where more radical changes should be made regarding dwelling units. Red means the biggest densification needed, green shows where less densification is required.

◀ Image 46
New map of the building levels

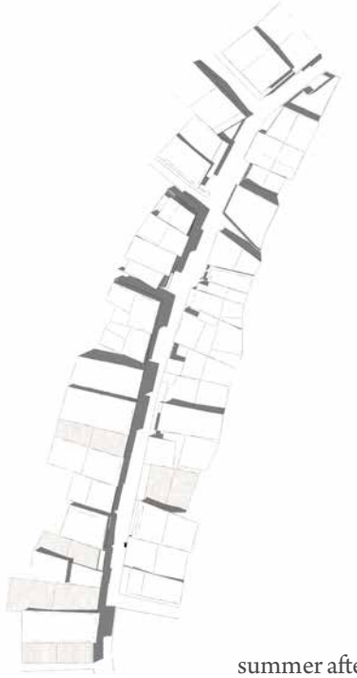
Keeping this in mind, a new masterplan was drawn, showcasing the vast height differences of the building levels throughout the street based on the heights per level of the existing houses.

► Image 47
Analysis of the shadow in the current state of the Rua Nova

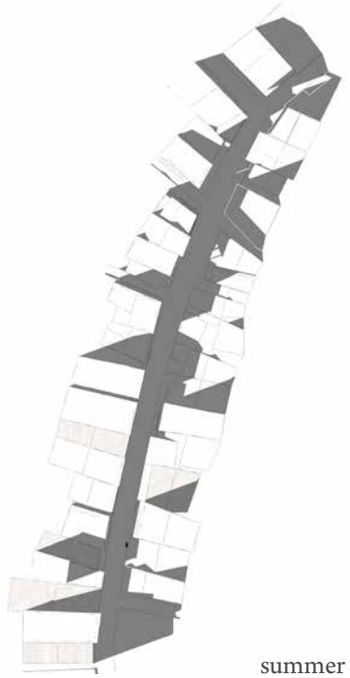
summer morning



summer midday

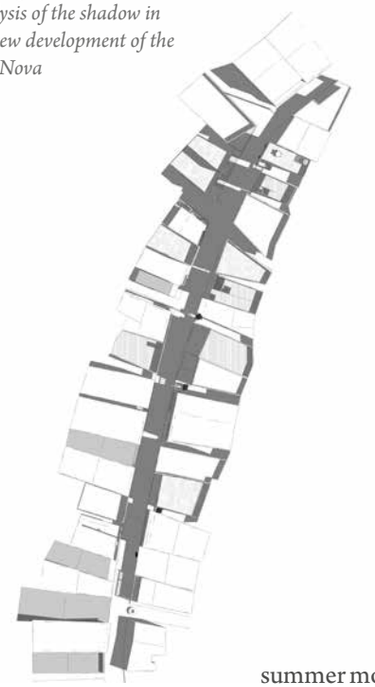


summer afternoon

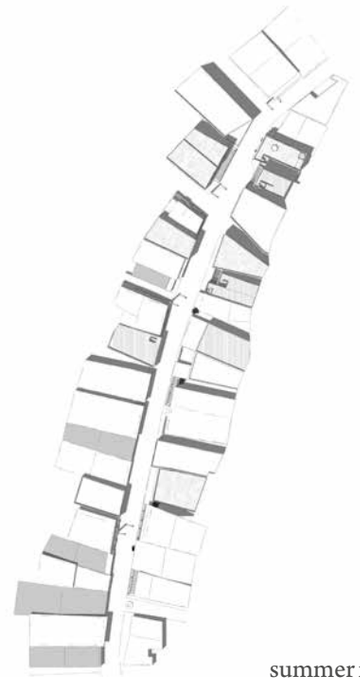


summer evening

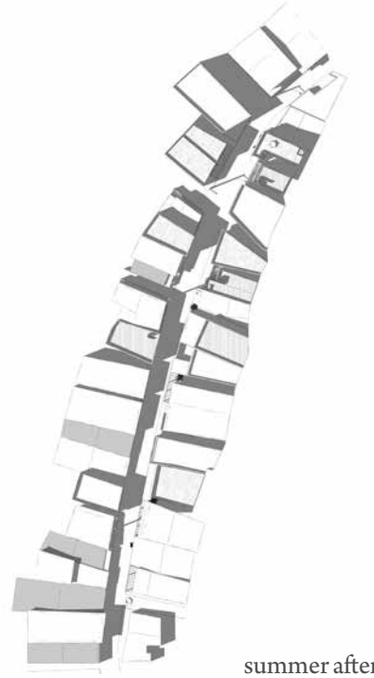
► Image 48
Analysis of the shadow in the new development of the Rua Nova



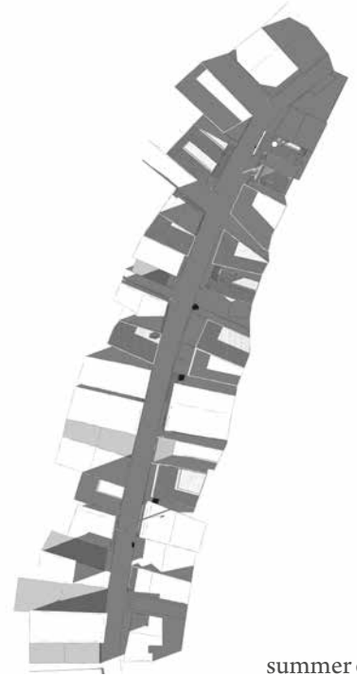
summer morning



summer midday



summer afternoon



summer evening

04

QUALITY OF LIFE

►Image 49
Looking south on the Rua Nova

◀Image 50
Map of the current road situation of the Rua Nova

SAFETY

Creating safe streets is a critical responsibility. Therefore, in common street design, reducing the risk of potential conflict is a main priority This could be achieved by e.g. reducing speed and shaping the street in a way to aid in protecting the most vulnerable users. Safety issues within a street can have a lot to do with sidewalks. Sidewalks emphasize the roadbed meant for motorists. If or when sidewalks are blocked, too narrow, or even nonexistent, pedestrians are forced onto the road,[1] thus resulting in an unsafe situation as is the situation today in the Rua Nova. The Rua Nova can be identified as a low-volume residential street with a narrow roadbed. There are no dedicated cycle tracks present, and no on-street parking is being maintained. The limited space includes present, but narrow and inaccessible sidewalks obstructed by utility and light posts, forcing pedestrians onto the road. Neither green infrastructure nor street trees are present causing motorists to drive dangerously through the street in both directions.

On safer streets, people feel more comfortable. Tools for safer streets are for example lighting, street furniture, and the presence of shade to support that safe environment. Better designed streets not only relieve mental and physical stress, they also connect people with their community and enhance social connections.[2] To become safer streets, they should no longer be designed by assuming 'place' is automatically subservient to 'movement'. A well-designed street demands that issues of place and movement go hand in hand. A sense of place will be considered as the character or atmosphere of a place, but also the connection felt by people with that place. Fundamental to a richer and more fulfilling environment is a positive sense of that place. This comes from the creation of a strong relationship between the street and the buildings and spaces that frame it.[3]

Therefore, the future development should focus for one thing on safer conditions in the street where pedestrians and cyclists are prioritized. It should focus on streets with low traffic volume, so the private sections that line the street can be expanded, increasing the opportunity for social interaction. The transformation of the street should aim to create streets that do not need rather unsympathetic traffic-calming measures added at the end of the design process. The provision of separate pedestrian

[1] Global Designing Cities Initiative, & National Association of City Transportation Officials. (2016). *Global Street Design Guide*, 10-11

[2] Global Designing Cities Initiative, & National Association of City Transportation Officials. (2016). *Global Street Design Guide*, 57-66

[3] Swinney, J. (2016, August 25). *Designing Streets: A Policy Statement.*

and/or cycle routes away from motor traffic should be avoided. This is why the concept of the shared street should be introduced in Ilha do Joaneiro. Right now, the Rua Nova operates de facto as a shared street in which children play and people walk and cycle, sharing the roadway with drivers. But the street has so much more potential as a well-designed shared space than it does as one today.

Shared street

In accommodating traffic, the street loses its primary purpose of the street acting as a 'place' that not only attracts people, but also investments and spending. The shared space is a tool to retrofit the street as a place, creating a more vibrant street scape. A shared street can be characterized as a people-oriented public space that encourages social interaction, walking, cycling, accessibility, and reduced traffic.[4]

[4] PPS. (2017). *What is Shared Space?*

Streets as shared social spaces

The design of the streets should acknowledge the importance of creating places for people to enjoy, rather than simply providing corridors for the movement of traffic. Streets should be designed with the focus on social interaction. The majority of the interaction within a community takes place in the outdoor environment, so street design should encourage this more by creating social spaces where children can play, people can stop to have a conversation, and other activities can take place safely. In order for this to happen, it is important that motorists do not dominate the street. The tendency for people to use the street as a social space will be increased because of careful design, and by the application of the user hierarchy where pedestrians are considered first.[5]

[5] Swinney, J. (2016, August 25). *Designing Streets: A Policy Statement.*

◀Image 51

View of the Rua Nova looking north

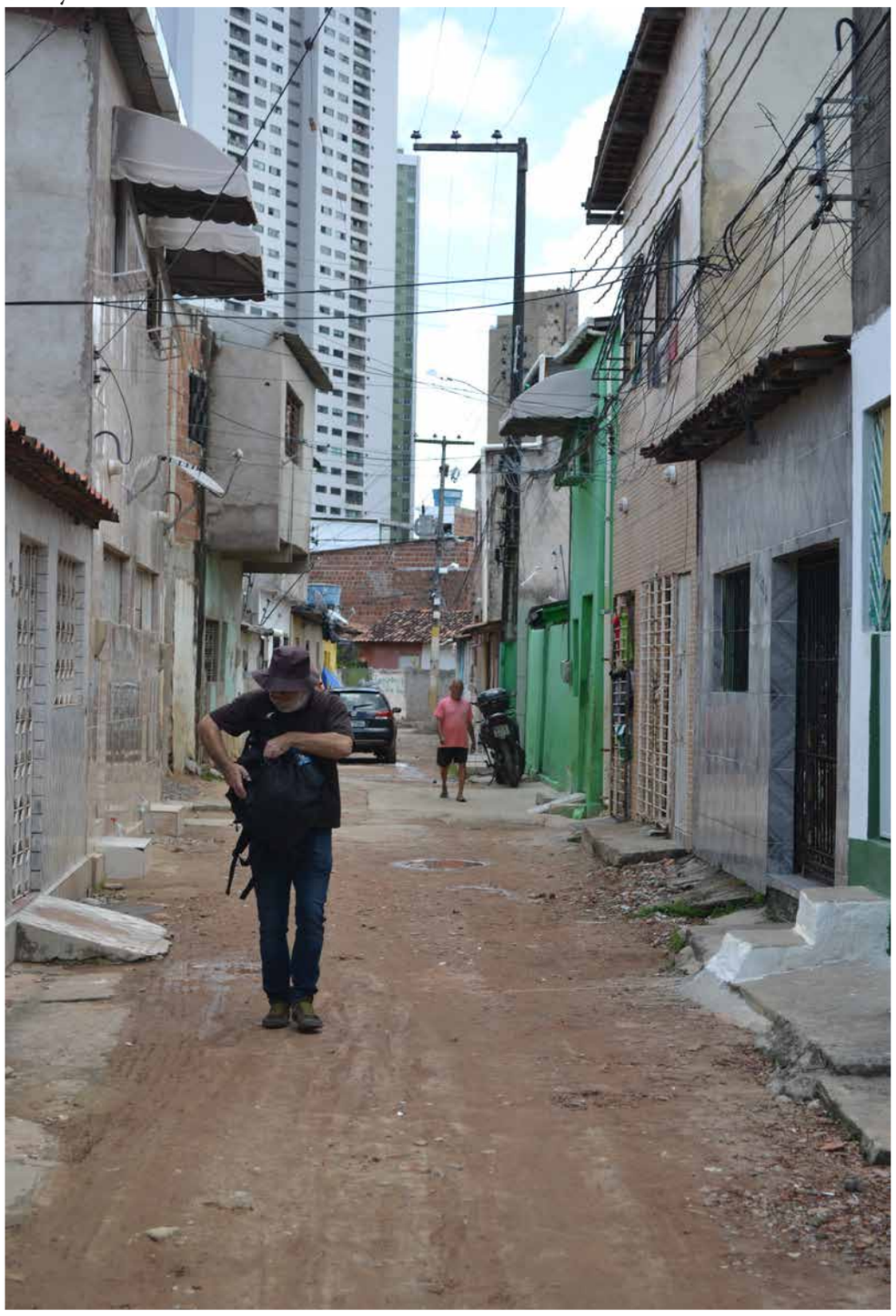


Image 52 (previous page)
view of the Rua Nova looking south

Image 53 (previous page)
View of a shared space in Ilha do Joaneiro

DESIGNING STREETS FOR PEOPLE

Overall, bicycles are the most common vehicles in favelas, followed by cars and then motorcycles. Motorcycles are mostly owned by youth, while vehicle ownership is mainly male-based. However, local trips within the favela are almost always done on foot and when traveling outside the favela, residents generally use public transport. [1] Therefore, the use of cars in a favela is not always evident.

[1] Pojani, D., & Stead, D. (2016). *The Urban Transport Crisis in Emerging Economies*, 11-30

Today, the few cars present drive in two directions on the Rua Nova. Add pedestrians, cyclists and playing children to the mix and it becomes a dangerous situation. The idea of a shared street does not cut off motorists completely, it just asks for better regulations. Vehicles are still necessary to make deliveries, or for residents to drop off groceries or people at their front doors. The future possible development should allow for a shared street where the physical distinction between the spaces dedicated to pedestrians, cyclists and motorized vehicles is removed. This causes the street to be shared by everyone, with each user becoming increasingly aware and respectful of the others.

In Ilha do Joaneiro, pedestrian activity is high and vehicle volumes are low. The transformation is based on local context and culture. In this case, curbs would be removed and the materials and space allocated would indicate that vehicles are guests. The shared street contributes to the public space network by adding vibrancy and activity with outdoor dining, public seating, and landscaping. It also becomes an extension of front yards, places to meet neighbours, and a place to build communities. Additionally, the pavement could be altered to add visual interest, such as using concrete pavers, which would make the street more accessible for families with strollers and for people with disabilities.

Lastly, to minimize traffic in the favela, but to allow the residents and visitors to experience more of the entire favela, a new mobility-plan is set in place. All streets bordering the Avenida Governar Agamenon Magalhaes work as an entrance to the favela. They then connect to an exit leading toward a broader street at the edge of the favela that loops back to the Avenida Governar Agamenon Magalhaes. This creates a natural flow through the favela, encouraging people to stop and make use of the available facilities in the favela. However, it is strongly recommended to park cars in front of the favela in the provided parking spots, and continue into the favela on foot.

◀Image 54
New mobilityplan (pedestrian walkway is indicative)
- *cars*
- *pedestrians*

◀Image 56
Map of the present state on light infrastructure

►Image 55
illustration of the utilities present in Ilha do joaneiro, sewers and water barrels

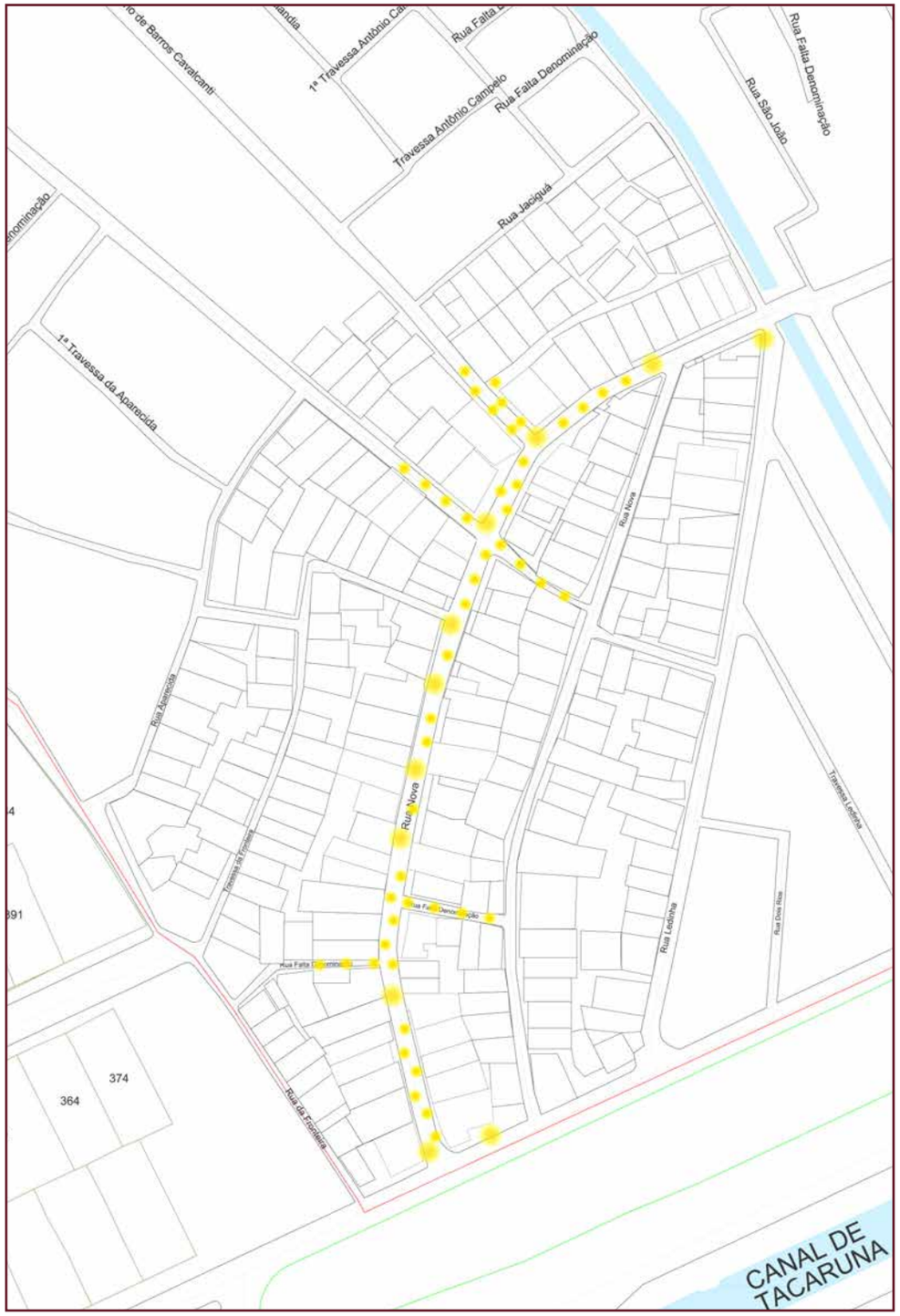
UTILITIES AND INFRASTRUCTURE

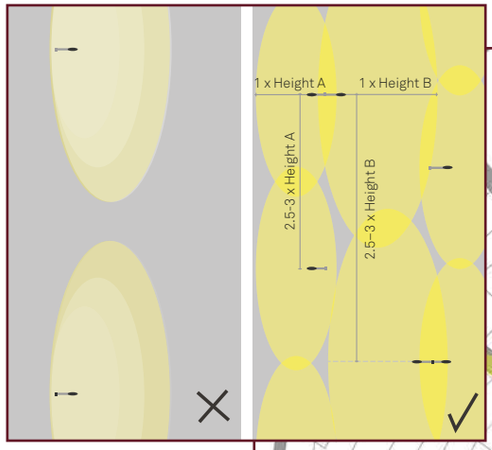
A community's quality of life is significantly improved by the presence of basic utilities, such as water, which also spurs social and economic growth. Clean and potable water should be distributed throughout the community, as well as the vital supply of electricity and communication infrastructure. They serve street lighting, homes, and businesses along the street. Wastewater infrastructure, such as sanitary sewers, help maintain public health and hygiene. It also diminishes environmental risks for instance, flooding, and water pollution. [1]

Ilha do Joaneiro has almost all basic utilities present in the community thanks to the cooperation between Marcone, the community leader, and government agencies. The only inconsistent access is to clean and potable water. As in most favelas, water barrels are placed on the roofs of the houses to provide residents with water at certain times in the week.

Lighting can improve quality of life by creating inviting, safe, and lively streets. When designed well, lighting can add to the sense of place, comfort, and character of a street. Lighting along all public roads, especially in areas with a high crime rate should be provided. In the current state of the Rua Nova, the street is poorly lit creating an unsafe atmosphere for pedestrians. Well-lit spaces are critical not only to pedestrian safety, creating lively, inviting spaces at night, and preventing crime, but also used to identify place. Hence pedestrian-scaled lighting should be placed along all streets, ensuring appropriate illumination levels and spacing to avoid dark spots between light sources.

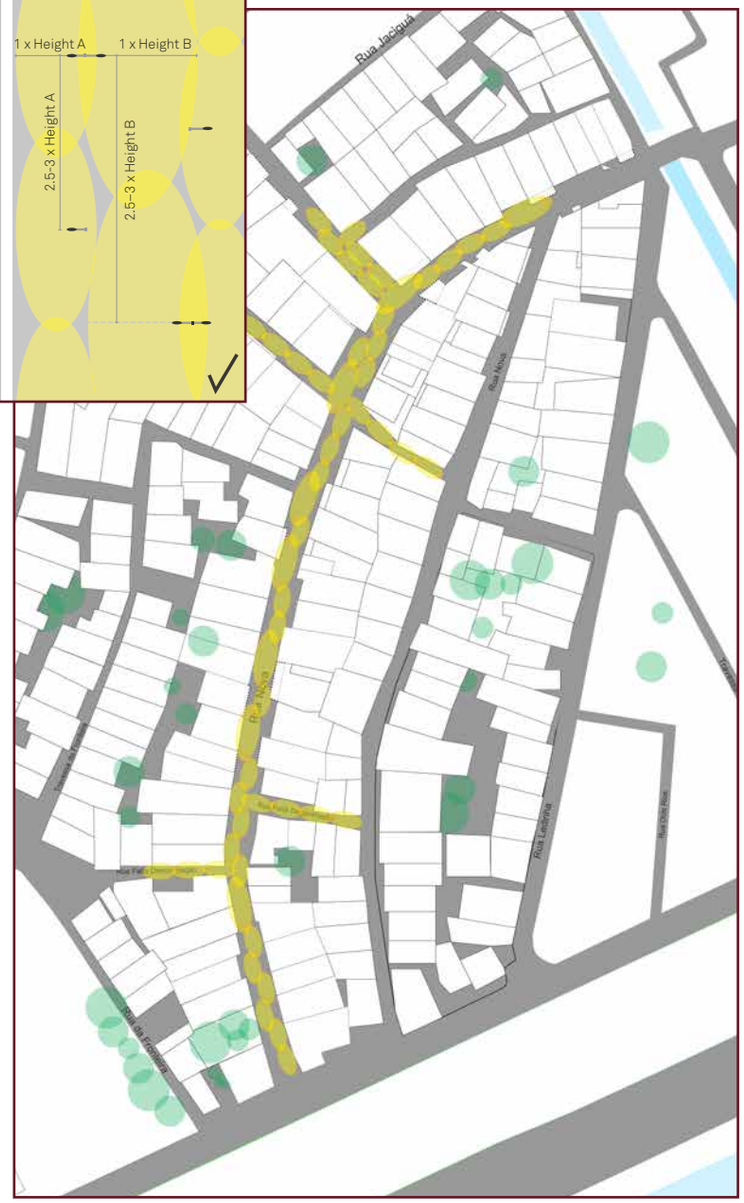
[1] Global Designing Cities Initiative, & National Association of City Transportation Officials. (2016). *Global Street Design Guide*, 151-163





▲Image 57
System used to determine location of new light infrastructure, global street design p 162

►Image 58
Analysis on the placement of new light infrastructure



◄Image 59
Map of the renewed state of light infrastructure

Starting from the current state of the community, a map was set up displaying the reach of the light infrastructure that is already present. The next step was calculating and drawing the new locations for light infrastructure more to the scale of the pedestrians. A height of 4.50 m was used for this model. The new lighting fixtures are placed in between the existing light poles.

► Image 60
Small alley in the middle of Ilha do Joaneiro with green added by the residents.

05 GREEN INFRASTRUCTURE

◀Image 61
An example of green infrastructure in Ilha do Joaneiro

BENEFITS OF GREEN INFRASTRUCTURE

(analytical framework)

Green infrastructure in urban streets complements traditional piped water drainage systems. Vegetation, soils and natural processes capture and infiltrate or evaporate water before it enters the pipe systems. Green infrastructure can help reduce flooding and water pollution by absorbing and filtering storm water. It simultaneously provides a natural relief to the built environment, improves the street aesthetic, and benefits the community.[1]

Introducing landscaping where possible creates a pleasant walking environment and it contributes to the character of the neighbourhood. It also encourages a more active choice of transportation and improves micro climate conditions. Street trees and landscaping can assist in improving local climate and reducing urban heat islands, thus minimizing the demand on energy-intensive air-conditioning in vehicles and adjacent buildings. Landscaping also has the benefit of cleaning the air from noise and air pollution. [2]

Street noise is one of the primary sources of noise pollution, contributing to a number of health problems, for example sleep disturbance. Urban trees and vegetation can reduce noise pollution by 3-5 decibels. Additionally, streets prioritizing pedestrians and cyclists help to reduce the number of personal motor vehicules, reducing emissions and air pollution. Besides that, landscaping also benefits water management. [3]

[1] Global Designing Cities Initiative, & National Association of City Transportation Officials. (2016). *Global Street Design Guide*, 159

[2] Ibid, 156-158

[3] Ibid, 9

▶ Image 62
Green infrastructure to prevent illegal waste
▶ Image 63
An small nook with some greenery also preventing illegal waste

[1] Global Designing Cities Initiative, & National Association of City Transportation Officials. (2016). *Global Street Design Guide*, 156-159

[2] Ozyavuz, M. (2013). *Advances in landscape architecture*, chapter 34

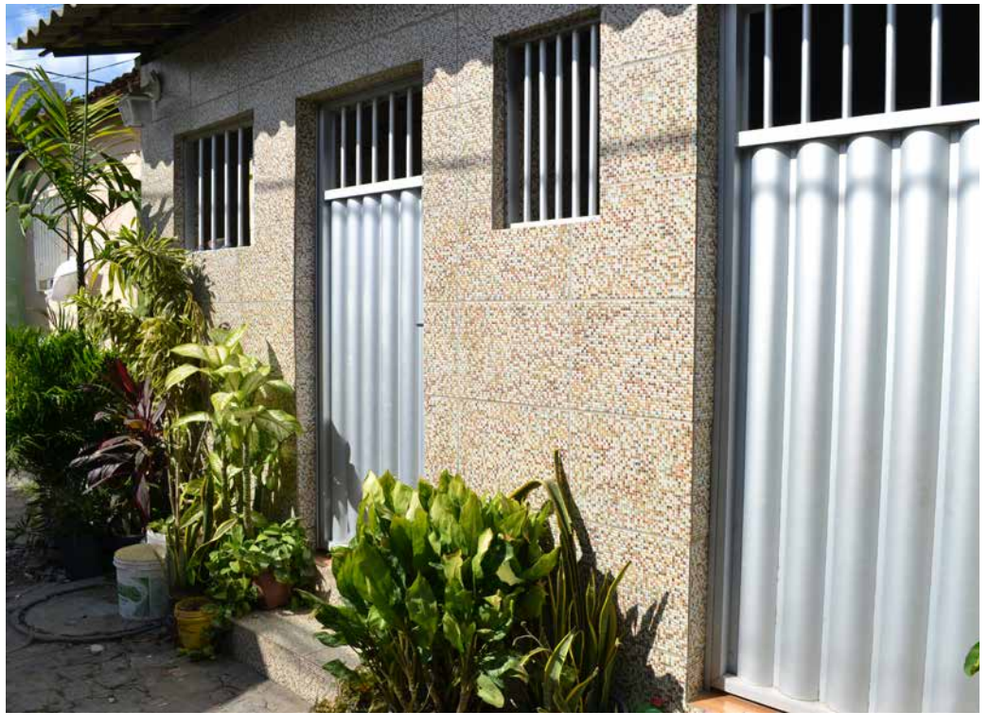
[3] Ibid, chapter 22

◀ Image 64
A small personalized garden in the middle of Ilha do Joaneiro

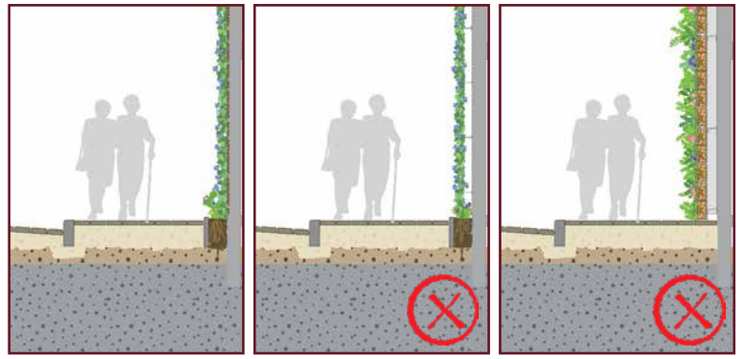
The incorporation of local plant species and green infrastructure strategies within the streets will help manage storm water and reduces the need for irrigation. Additionally, urban trees and vegetation offer physical and mental health benefits by decreasing stress and aggressive behaviour in cities and has been linked to reducing crime. Furthermore, green streets capes enhance urban biodiversity as native species provide habitats for birds, insects, and other wildlife. [1]

Native vegetation is better suited to the rainfall of the local area. Enhancing the biodiversity in cities can increase environmental awareness among urban residents. Lastly, green infrastructure reduces the cooling demand of buildings by reducing local temperatures and shading building surfaces, thus cutting energy needs. Green facades attract and lose less heat, the plants also cause evaporation, which helps keep the community's climate cooler.[2]

Recently, in larger districts this vegetation is used for many more purposes such as capturing fine particulate matter, as well as contributing to cooling the community. The advantage is that it takes up little space in an already intensively used urban area by providing many vertical metres of green. One should not forget that a climbing plant, which can cover a five storey building in the span of a few years, requires sufficient space for its roots to remain healthy. The plant does not need much space on the ground, but some space is required underground.[3]



◀Image 65
Personalizing of the facade through green infrastructure



▶Image 66
Three facade systems for climbing plants. source: https://www.urbangreen-bluegrids.com

There is the question of damage to a building by roots of climbing plants and it will cause a problem with plant roots but only if the facade already has loose mortar or cracks. It is therefore important that a building is inspected for faults and have these repaired before planting any vegetation. With climbing plants, the building will also need to be maintained over time, and all roots, tendrils or twining stems must be removed from windows to prevent damage. [1]

Additionally, vertical vegetation protects the walls from direct solar radiation. The facade heats up less, absorbs less heat, and emits less heat at night. Water is evaporated by the plants, enhancing the cooling effect in the surrounding area. In short, vertical vegetation has a regulatory effect on the maximum temperatures. Evergreen climbing plants such as ivy also protect the facade from cooling in winter. For shade, climbing plants can also be used for pergolas.

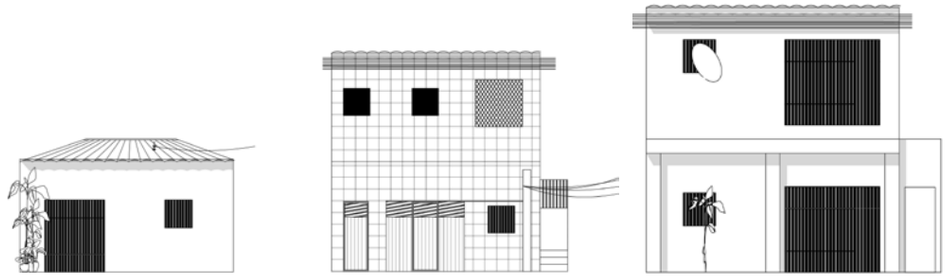
Besides improved air quality and cooling effect in the vicinity of green area, green in an urban area has many positive effects on health, recovery, and the ability to manage stress. Vertical green has the advantage that even when buildings are close together and there is little opportunity for horizontal green, vertical green can always be utilised.[3]

[1] Pötz, H., & Bleuzé, P. (2012). *Groenblauwe netwerken voor duurzame en dynamische steden.*

[2] Ibid.

[3] Ibid.

◀Image 67
Overgrowth of green against a facade on the Rua Nova



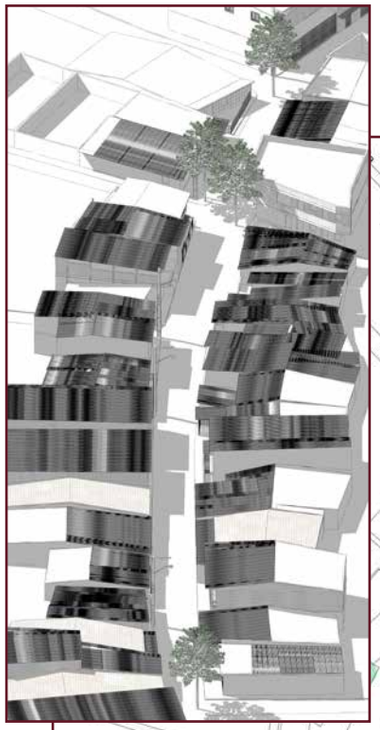
►Image 68
Contrast between the use and the lack of green in the Rua Nova

VERTICAL GREENERY

(conceptual framework)

Vertical gardens offer many different opportunities. They can serve as a barrier from the bright sunlight and cool down facades. However, the way they are created can differ greatly. By analyzing the existing usage of greenery in the community, a few methods of application were designed. The density of vertical green is greater dispersed if only potted plants are spread over the facade line. By using one-tile gardens in front of the facade and combining this with climbing plants, a much denser vertical garden is created to block out heat and light. Once hanging plants are integrated as well, the vertical garden can act as a decent buffer against the sun, while requiring a minimum amount of maintenance.

◄Image 69
Analysis of the density of vertical gardens.



▲Image 70
Three different native trees to the northeast of Brazil to use in the favela.

STREET TREES

Trees offer many advantages to cities; under their canopies they create space, offer coolness, produce oxygen, and offer living space to many birds and insect species. Trees only have one disadvantage: they grow slowly. For this reason, it is important that existing trees are kept and protected. It is important to find a suitable spot for a tree so it can develop its canopy fully. It is best to think well before planting a tree than to heavily prune one afterwards.[1]

With this in mind, four new trees were added to the Rua Nova, their location ideal to develop fully. Three trees are grown on the plaza, near the cross sections, and the fourth tree is placed at the beginning of the Rua Nova, close to the entrance of the street. The trees serve as a connection between all three zones of the street.

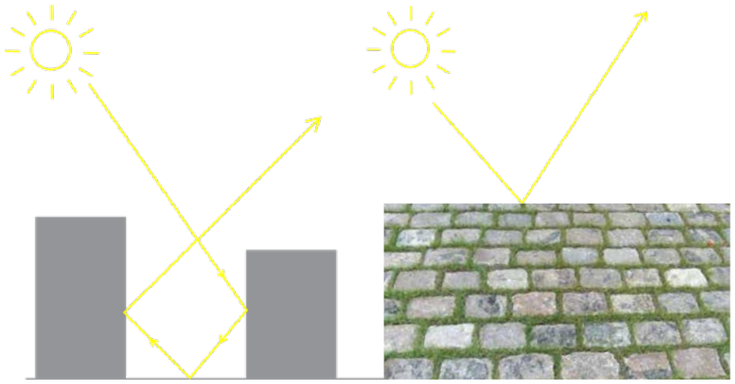
For this design, it was important to look at native trees. This means tree species that are naturally found in the region of Northeast Brazil. An advantage of choosing local trees, is helping wildlife live and thrive, preventing some animal populations from rapidly declining. It helps support the local ecosystem, and native trees also have the best chance of survival in the local climate.

If opting for fruit trees, the residents of the community could benefit from the fresh fruits that are grown. It could even encourage them to choose more green and cultivate their own fruits and vegetables. This is an opportunity to become more self-sufficient in their daily lives.

[1] Pötz, H., & Bleuzé, P. (2012). *Groenblauwe netwerken voor duurzame en dynamische steden.*

◀Image 71
Axonometric view of the new street trees.

◀Image 72
Map indicating the new location of four prominent trees.



▶ Image 73
Illustration of a area with only hardened materials and concrete pavement

▶ Image 74
Illustration indicating the better reflection of sunlight through another pavement system.

PAVEMENT: MATERIALS AND TEXTURE

The current pavement of the streets in Ilha do Joaneiro consists of cobblestones and concrete. Due to the tropical climate, people do not benefit from all these hard materials. The reflection of sunlight by the present materials is significant in the new design proposal. The relationship between materials and the reflection of sunlight is expressed in albedo. Albedo is measured on a scale of 0-1. If the surface of a material absorbs all the sunlight, it has an albedo of 0, so no reflection. Otherwise, if it reflects all the light that hits it, it has an albedo of 1.[1]

The higher the albedo, the less the sun radiation that gets absorbed by the planet, and more radiation is returned to space, which cools down the Earth. This is highly important in terms of climate change. In areas with lots of paving, buildings and people, the effect of low albedo can contribute to the phenomenon of an urban heat island, which we should try to avoid at all costs.[2]

Therefore, the choice can be made to still use and reuse the present cobblestones, but to exchange the concrete grout for grass. The albedo of grass is higher and thus reflects more light energy than concrete does. This is a small intervention that could result in a big impact on the temperature inside the community.

[1] North Carolina Climate Office. (n.d.). *Albedo.*

[2] Ibid.

▶ Image 75
A family selling nuts at the entrance of the Rua Nova

06 STREET FURNITURE

◀Image 76
Collage of people sitting on the street in Ilha do Joaneiro and the lack of street furniture

Urban street furniture

Public space in a community is an important backdrop for gatherings and everyday social life, and it serves an important role in communication. The organization of objects within the public space determine which uses are possible or allowed, and give an indication on how we should move through and use the space. One central aspect of the organization and physical structure of public space is street furniture. Street furniture refers to all elements found in (semi-)public spaces. Urban furniture elements is more than just benches. The term also refers to litter bins, bicycle racks, bollards, signage, etcetera,... divided by their function which include play, waste disposal, shelter, way finding and more. [1]

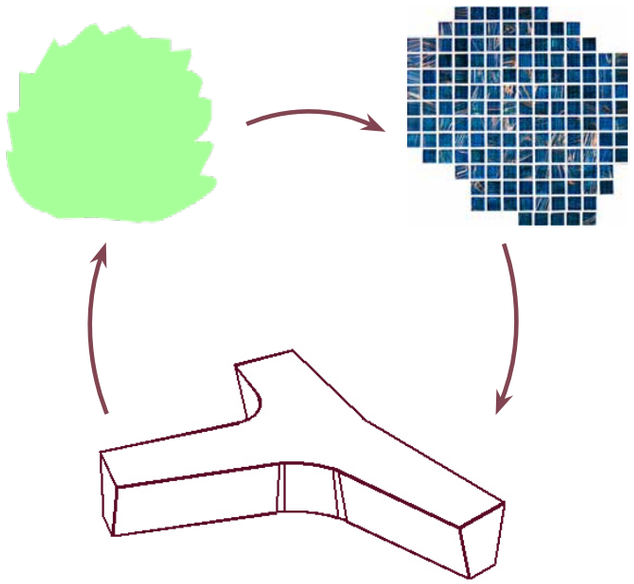
[1] Dellenbaugh, M. (2017, January 23). *The physical and social normative properties of street furniture.*

For this segment, the focus is on the function of seating as street furniture. The specific function would be to provide a space for rest, reflection and contemplation in the public space. It is to allow people to enjoy a more comfortable experience in their streets and other public areas. It is another way to improve the quality of live for the residents of the community.

They could also have a 'play' function without being children's playground equipment. They have an entertainment element, such as tables with an integrated chess board, or a organic shape they could climb. They could include planters or bicycle racks. Therefore, street furniture should be multi-functional. They can provide a place to sit while enjoying the view or while watching the kids play on the bench they sit on. The position, orientation and arrangement of benches in particular determine the orientation of bodies in space, and the feature or features of the landscape that those bodies will be oriented towards.[2]

[2] Tosca, K. (2019, April 3). *What is urban furniture?*

As seen on the collage on the left page, there is a high need for street furniture. Residents now sit on chairs lining the street or on the sill of their front door., and social interaction is restricted to direct neighbours. This segment tries to develop a new bench that fits all requirements of being a multifunctional element.



◀Image 78
Axonometric view of the new street trees.

◀Image 79
Map indicating the new location of four prominent trees.

▲Image 77
The waterbench designed by alumnus of the University of Antwerp Barbara Standaert

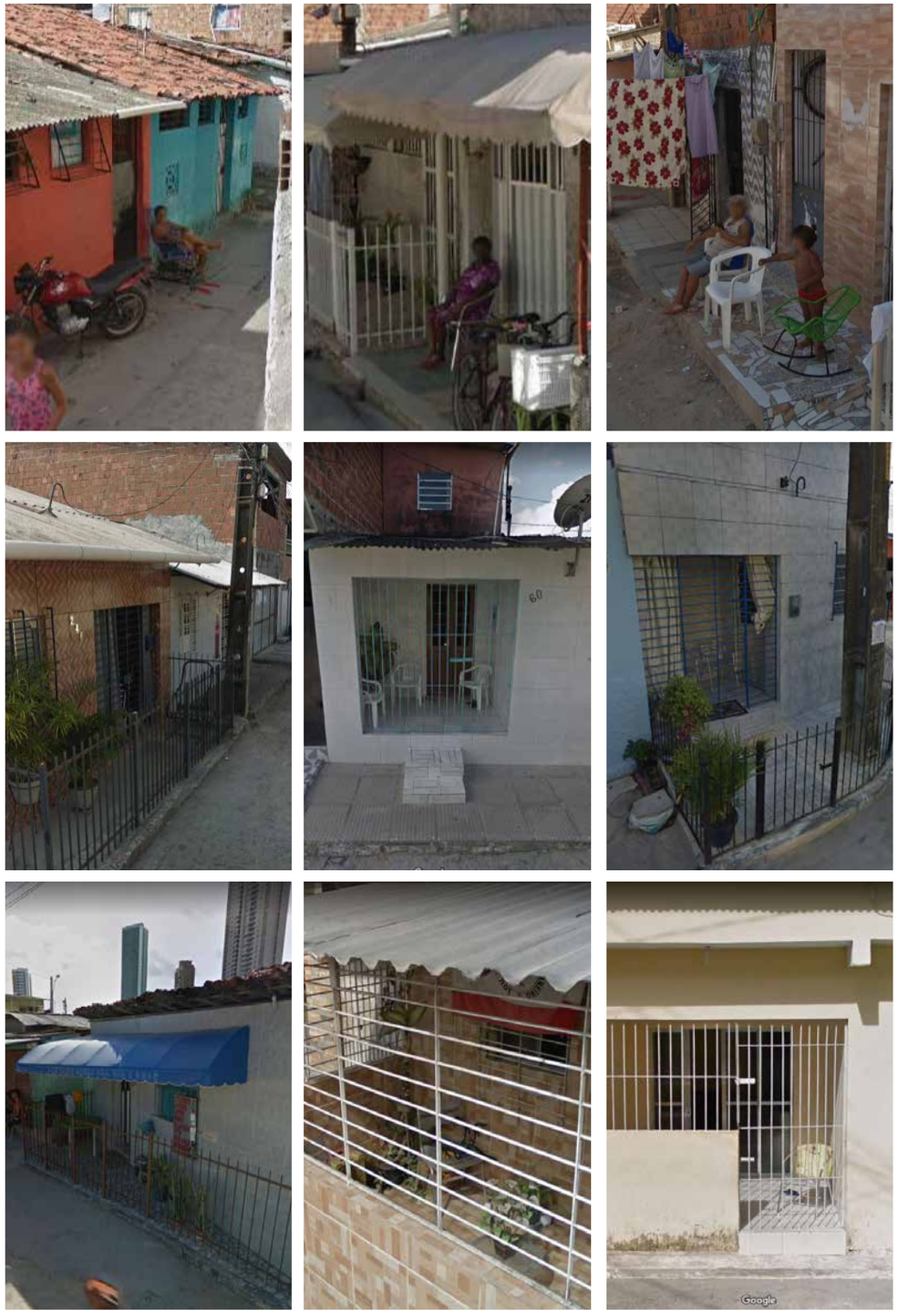
MULTIFUNCTIONAL AND PERSONAL

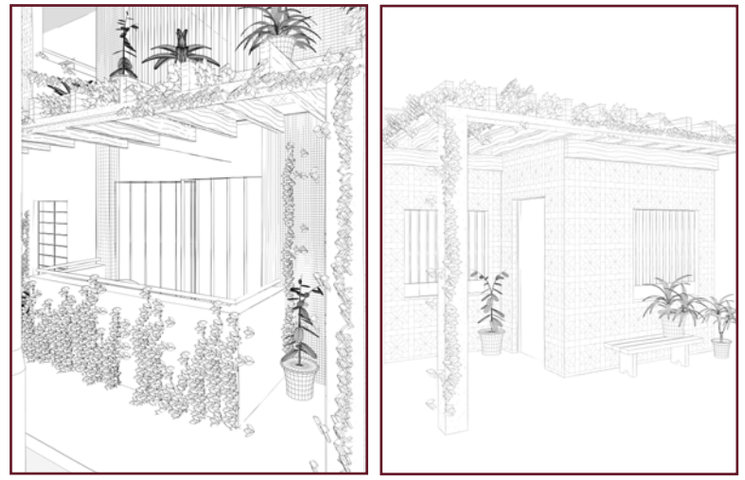
The new street furniture in this project could be multifunctional. Looking at the example of The Waterbench by Barbara Standaert [1]; the bench collects rainwater with which to water the plants. The bench becomes a connection between the community and nature on the one hand, and between nature and concrete on the other. [2]

The new bench would be manufactured in concrete and finished with a layer of tiles. This gives the inhabitants the possibility to personalize the benches in their vicinity. The tiling can become very personal by using different colours and textures. By utilising concrete, the community can completely fabricate each and every bench by themselves by using a mould. Again, leaning towards the self sufficiency of the residents of Ilha do Joaneiro. The actual shape of the bench is in the shape of a twig, giving the possibility to connect several benches together and as such creating a more interesting streets cape.

[1] Standaert, B. (2018). *Waterbench.*

[2] Ozyavuz, M. (2013). *Advances in landscape architecture*, chapter 23





►Image 80
Two possible ways of private seating interacting with life on the street

INTERACTION PUBLIC AND PRIVATE FURNITURE

As seen in the collage on the left, people use their front rooms or canopies to sit under and enjoy life on the street from the safety of their homes. The threshold between public and private should be lowered to create a better interaction between the homes and life on the street. A possibility to accomplish this is to create a more charming and attractive outdoor space in front of their homes using the infrastructure they already have, but without the presence of level high steel fences. This would also encourage people to use the street as a place where they can place furniture in little nooks and crannies or wherever they want to make the street more of their own.

The presence of canopies, small gardens and little terraces are encouraged to be used for more than just visual pleasure, but to also engage in conversations and receive guests for e.g. to share a drink. Additional research on the subject of interaction between private and public through furniture should be done.

◄Image 81
Collage of private furniture to enjoy outdoor life

►Image 82
Different house typologies at the beginning of the Rua Nova

07 TYPOLOGY OF TRANSFORMATIONS

◀Image 83
Map of the current state of the Rua Nova

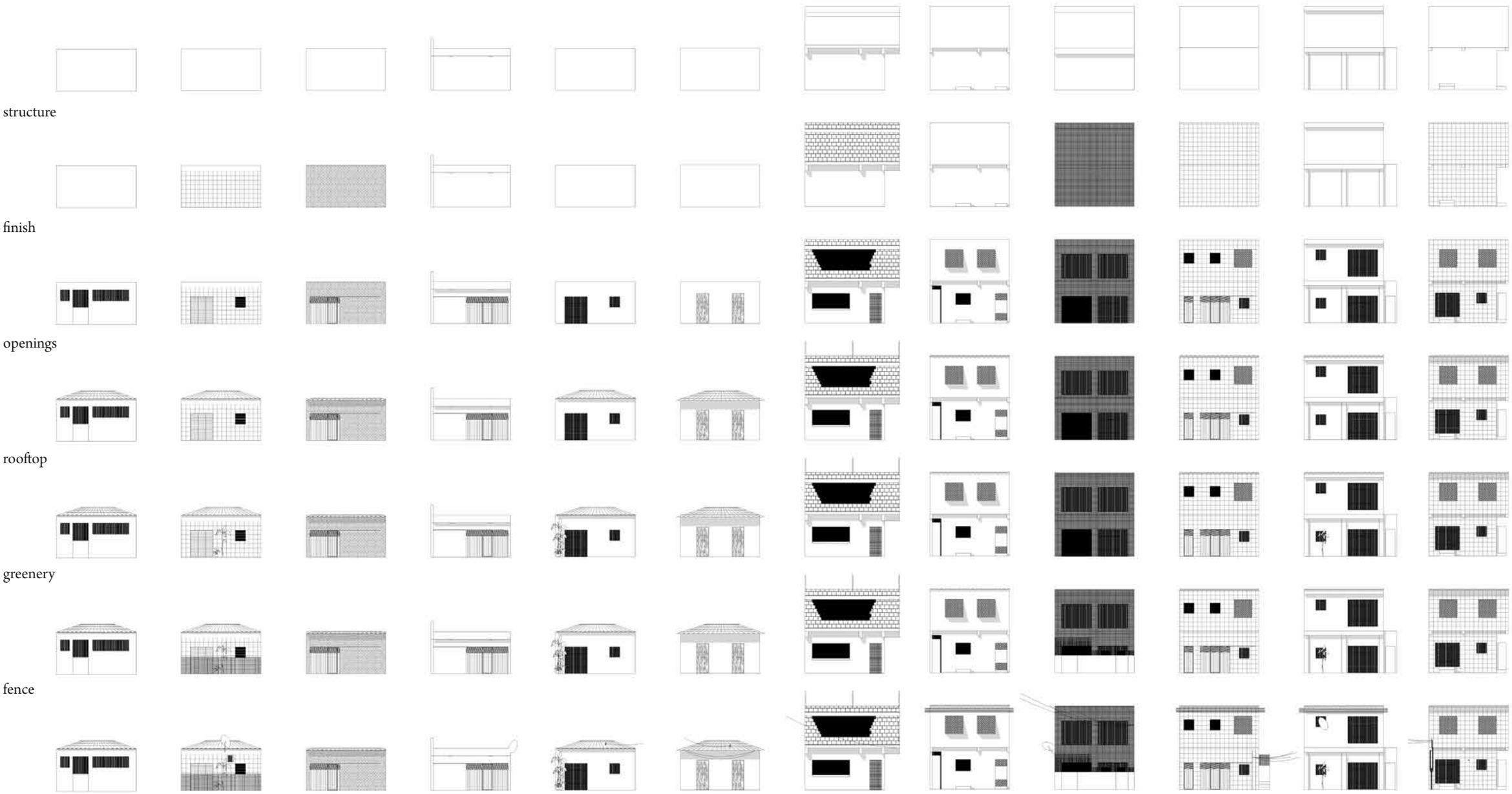
DEFINING PLOTS

[1] Global Designing Cities Initiative, & National Association of City Transportation Officials. (2016). *Global Street Design Guide*, 76-77

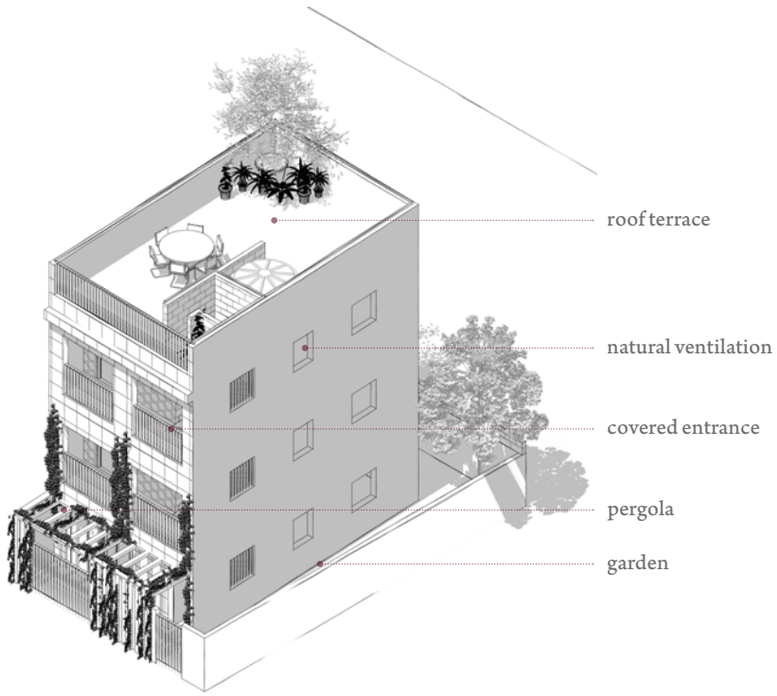
Building facade design plays an important role in shaping the overall pedestrian experience. The design of the ground floor influences the character of the street and the level of pedestrian engagement. Frequent entrances, appropriate transparency levels, visual variation, and textures all contribute to shaping an enticing street environment. [1] It is stated in 'Cities for people' that if buildings also have a primarily vertical facade expression, walks seem shorter and more manageable, whereas buildings with powerful horizontal lines underscore and reinforce distance. We should be designing the city at eye level, thus the ground floor. In recent decades, ground-floor design has suffered a setback in the form of large units, closed facades, blind windows and a lack of detail. (Gehl & Rogers, 2010, pp. 240)

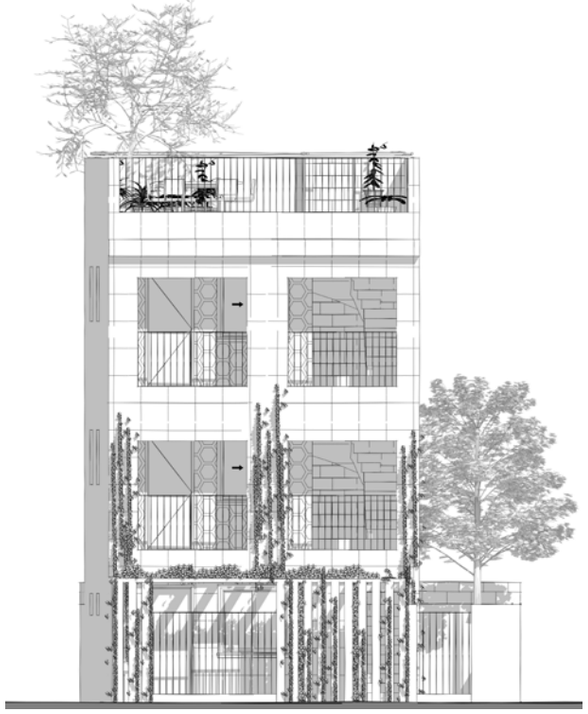
FACADE

The following page contains an analysis done on several different facades present throughout the Rua Nova. These facades examples, taken from all over the Rua Nova, were put in a matrix to get a better visual on the typical characteristics of the facades. A common occurrence is to use tiles as a finish, the benefits are maintenance and reflecting the sun. A downside to the use of tiles, is the higher purchase price. Another observation is the presence of frequently closed facades. A lot of people use gates to close off their front facade, creating an unsafe feeling since there are less eyes on the street at night. Lastly, some of the houses have started to place plants at the front of their building, confirming their need for more green in the street.



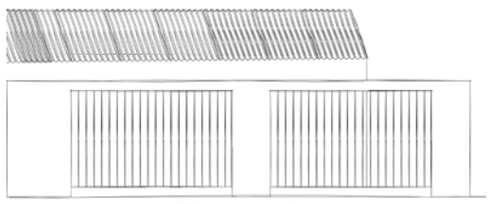
▲Image 84
Matrix of the different layers in a facade

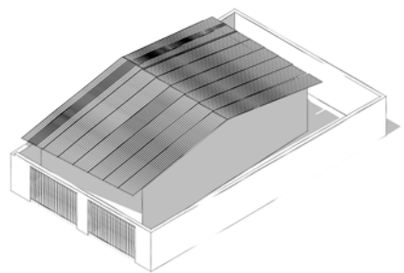




◀Image 86
Axonometric view after the transformation indicating the advantages

◀Image 87
Facade of the transformed house





▲Image 85
Facade and axonometric view of the existing house

TRANSFORMATION 1: INTRODUCING THE PERGOLA

The first house transformation progressed naturally from the development of the building. A three level building with an added rooftop terrace is used by the residents to dry clothes or entertain guests. In addition to the terrace, a garden on the side that had since been excluded from the existing situation, keeps the space open. It also offers the opportunity to add windows looking onto the garden for natural ventilation.

The entrance on the ground floor is enclosed through the use of a pergola. This pergola can be grown over by climbing plants, offering shade and a broad ecosystem in front of the building. The pergola offers a more comfortable area to engage in social interaction with other residents of the community.

Two doors are added to the front of the building. One leads to the ground floor unit, the second door leads up a staircase to the next level. The upper levels have an encapsulated balcony that serves as a covered entrance for the other units. The staircase then leads up to the roof terrace.

Advantages of this design are the pergola, the covered entrance, the presence of a rooftop garden, and the added ventilation through a side garden.

◀Image 88
Interior view of the covered entrance

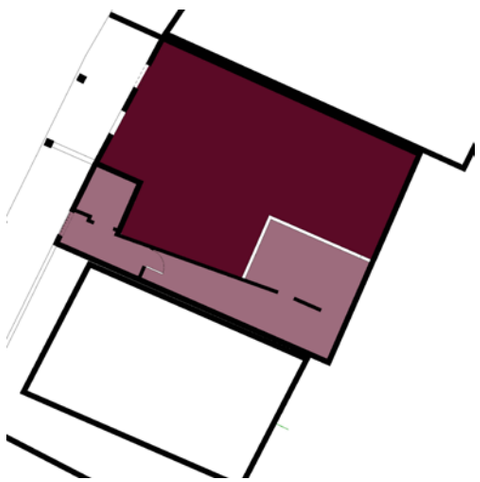
▶Image 89
Axonometric view in colour

ANALYSIS OF THE TRANSFORMATION OF THE WORKSHOP CASE STUDY

▼Image 90
Floor plan of Binhas and her neighbours house

"NEIGHBOUR"

DONA BINHA'S HOUSE

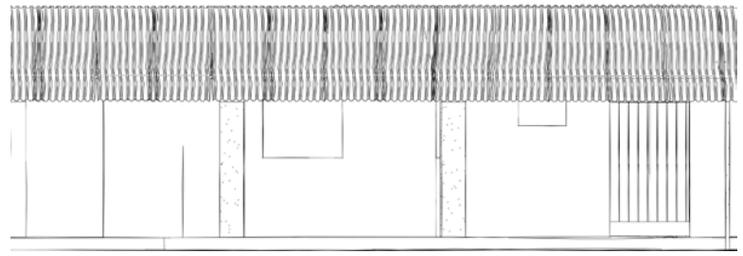


For the second typology from transformation , an analysis is done on the house used as a case study during the workshop at the beginning of this research. This house is an atypical representation of the houses common in Ilha do Joaneiro. First a description of the current state of the house will be presented, followed by research done on the different possibilities of how this house could develop. This results in the second typology from transformation where a general transformation design is created that can be used in different cases through the Rua Nova.

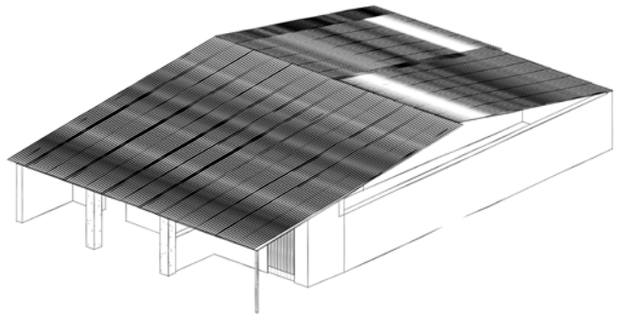
current state

This is the existing state of the house of Dona Binha. The house has one level, the ground floor, with a height from 1.70m up to 3.00m. The area has a total surface of approximately 24m^2. Eight family members live their daily lives in this house. The house is one of two units in a building owned by Binha's sister-in-law. Binha bought the part she lives in about 30 years ago. The relationship between both families is tense, and the fact both live beside each other does not help their situation. The bedroom wall between both their homes is only 1.50m high, giving no privacy to either of them.

▶Image 91
Facade



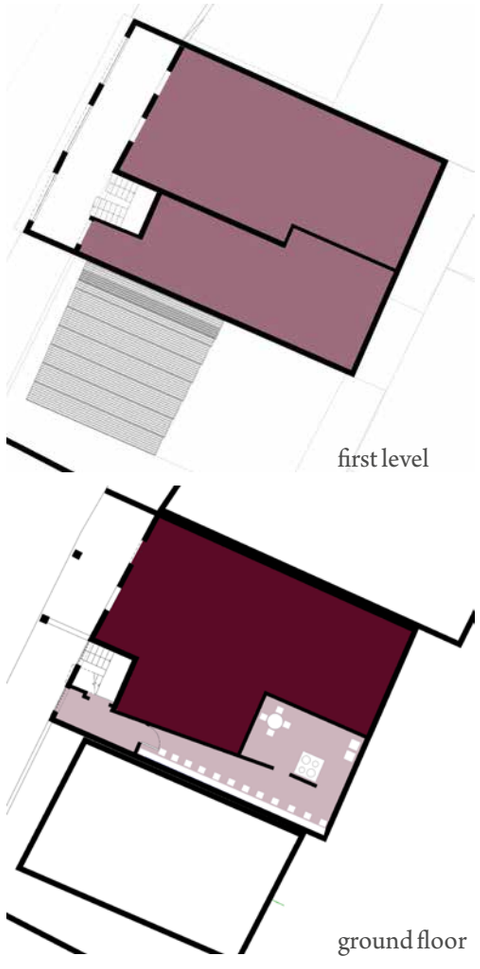
▶Image 92
Axonometric view of the existing house



Binha sells lottery tickets in front of her house, and is planning on selling popsicles she makes herself. Nothing in this house is organized properly for a family of eight to live there, let alone for a family to live and do business out of the same space.

The biggest issue is therefore, space. The best solution here would be to build another level, however money is tight. All renovations have to be done by themselves, using local materials and construction workers who are willing to help them. Therefore, the proposal to transform their hosue has to abide by the restrictions in place in order to improve their home.

▼ Image 93
Floor plan ground floor and the first level of a first possible transformation



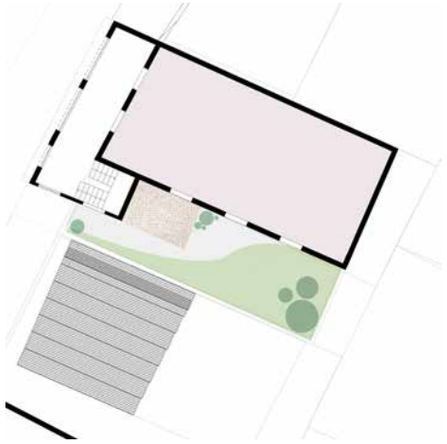
A first possibility was layering new levels on top of the existing building. It would give Binha the possibility to expand her popsicle business by having a space on the ground floor for people to sit down. The sister-in-law does not approve of having any changes happen to her home.

This design gives the opportunity to have a covered entrance with a small terrace on higher levels, creating a more active facade.

However, the downside to this design is that no windows can be placed on the side wall due to the possibility of a neighbour expanding their building as well. Therefore, the only natural light source and fresh air is through the front windows.

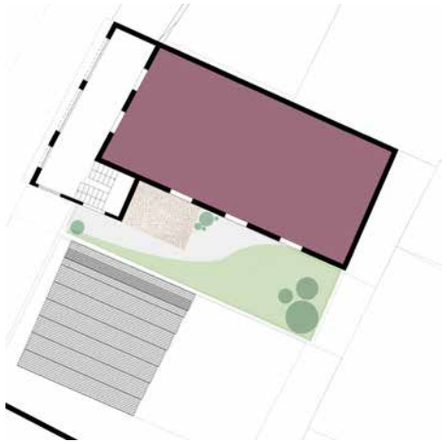
▶ Image 94
Facade

▶ Image 95
Axonometric view of the first transformation option

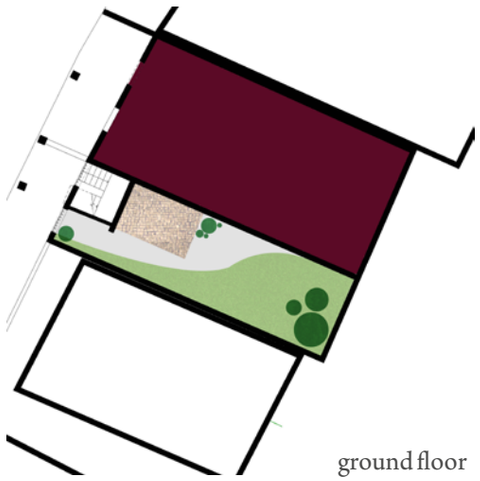


◀Image 96
Floor plans of the second possibility to transformation

level 2 and 3



first level



ground floor

"NEIGHBOUR"

DONA BINHA'S HOUSE

BINHA'S FAMILY MEMBERS HOUSE

To create better ventilation through the building, Binhas part of the building is converted into a garden. This garden benefits the entire community by preventing the heat island effect.

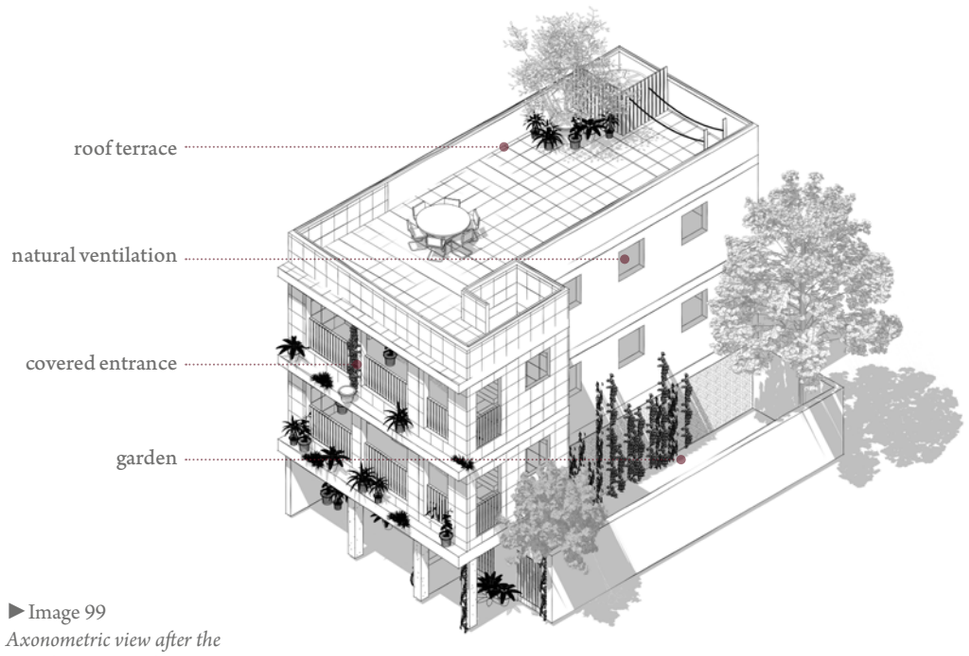
The sister-in-law still lives on the ground floor, but can add some windows as well, having a more conductive wind flow through her house. Binha will live on one of the higher levels, and the rest of her family can rent one of the other levels.

In this scenario, Binha will rent a freestanding space a few buildings down where she can sell her lottery tickets and popsicles.

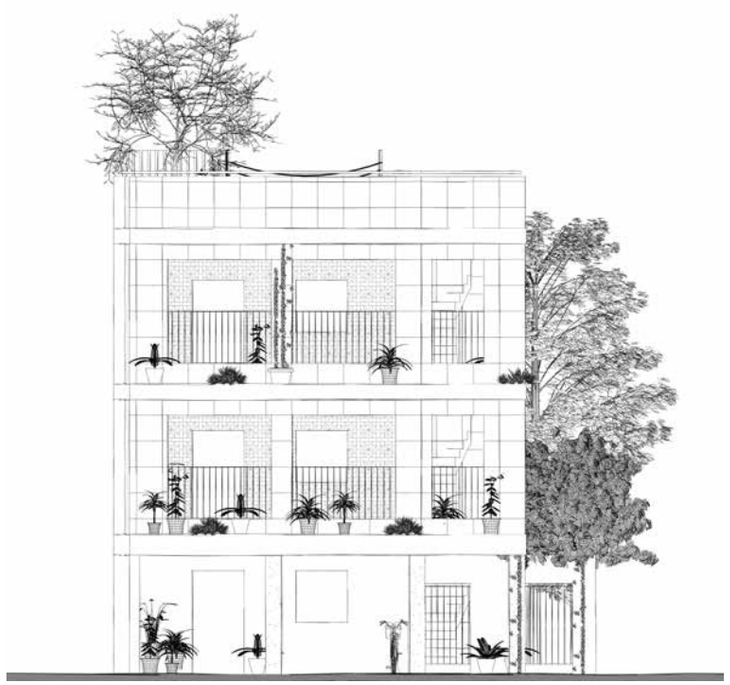
Unfortunately, this design is not feasible since four levels require an elevator and a permit by the city, but this design is the first steppingstone to the new housing typology in the community.

▶Image 97
Facade

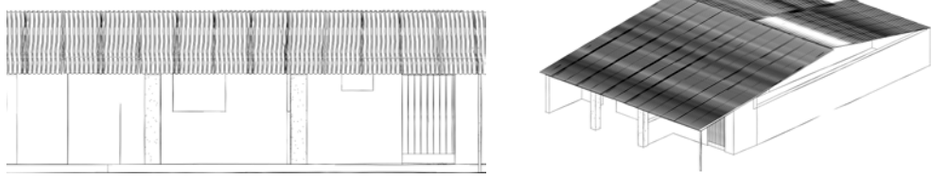
▶Image 98
Axonometric view of the second improved transformation



▶ Image 99
Axonometric view after the transformation indicating the advantages



▶ Image 100
Facade of the transformed house



▲ Image 101
Facade and axonometric view of the existing house where Binha and the sister-in-law live.

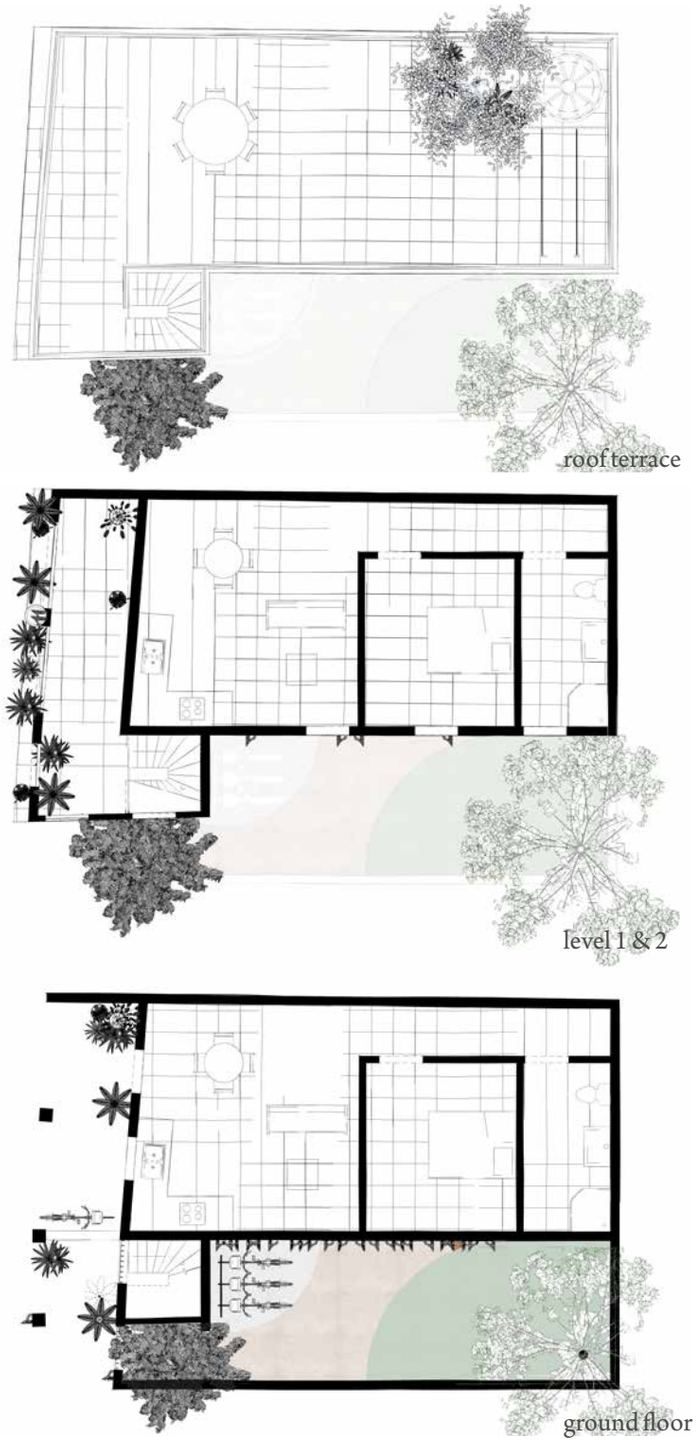
TRANSFORMATION 2: SYSTEM OF THE SIDE GARDEN

The second house typology from transformation is based on the previous analysis of the transformation of the case study of Binha's house. Limited to three levels with an added roof terrace, this house invites you in underneath an overhang. The staircase leads you up to the higher levels, where a covered entrance is ensured. This could also serve as a small terrace to sit on, providing some shade from the sun.

The roof terrace offers enough space to place a water barrel (= caixa d'agua). This water barrel provides water for approximately three families. Next to the water barrel, residents can use the roof terrace to hang their clothes to dry or to host a party on the weekends.

The garden next to the building adds more value by opening up the space, providing the opportunity to use more windows on the side wall. This creates better ventilation throughout the house, improving the living conditions in this tropical climate. The green garden also offers tranquillity and peace.

First of all, a new level was added before the right part was demolished. Therefore the family can relocate to their new unit followed by the demolishing of the house. Once the house is gone, a garden can be established.



▶ Image 102
Floor plans transformation 2

▶ Image 103
Axonometric view of transformation 2 in colour

SYSTEMATIC GREEN

Continuing the pattern of side gardens every two houses, an overall greener masterplan is created. While these gardens are private, the entire community will benefit from the presence of grass, plants, and trees, as well as the present wildlife. The heat island effect is prevented, the ecosystem will expand and the mental health of the residents will flourish.

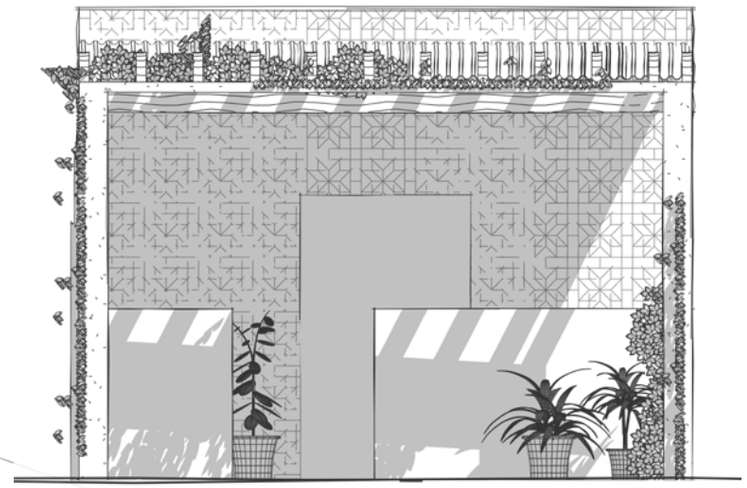
Further, to maximize the wind flow through the gardens, a similar opening should be made on the other side of the building block. This system can be applied in most cases, however, this operation can unfortunately not be done everywhere. Therefore, solutions are tried to be found for these exceptions guided by a series of different scenarios.

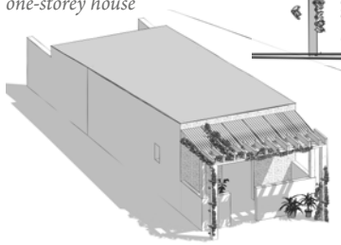
◀Image 104

Map system of side gardens implemented in the community

◀Image 105

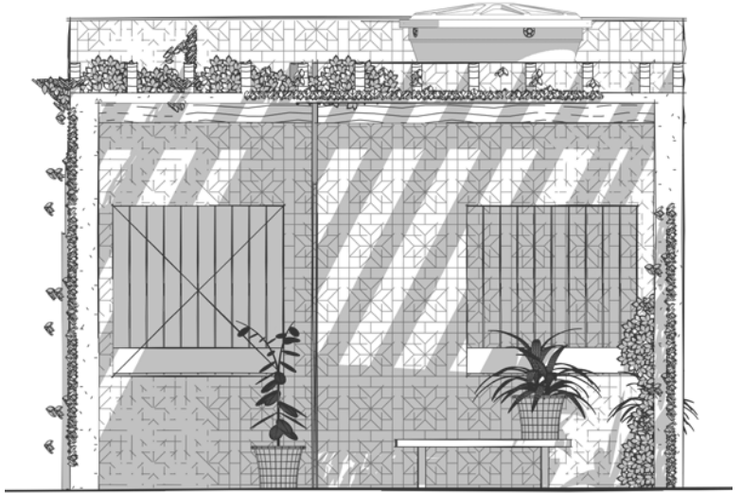
Top view of the side gardens at the Rua Nova

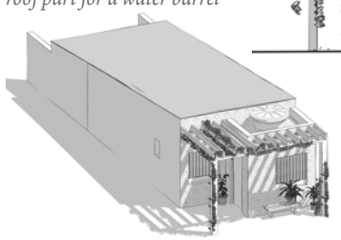




►Image 106
Facade first possible transformation of one-storey house with the addition of a pergola

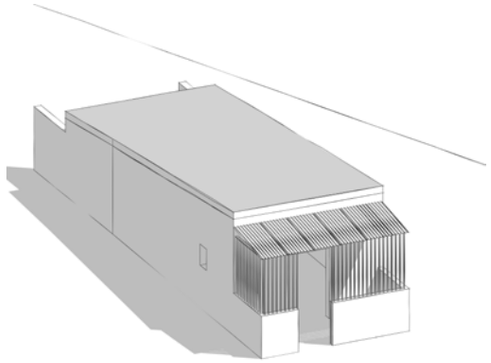
▼Image 107
axonometric view first possible transformation of one-storey house

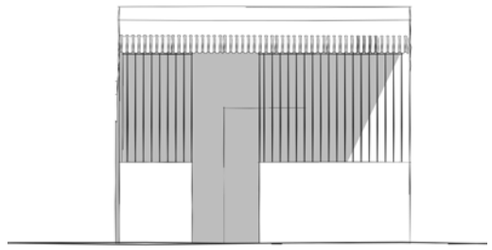




►Image 108
Facade second possible transformation of one-storey house with an added water barrel

▼Image 109
Facade of the transformed axonometric view first possible transformation of one-storey house with a flat roof part for a water barrel



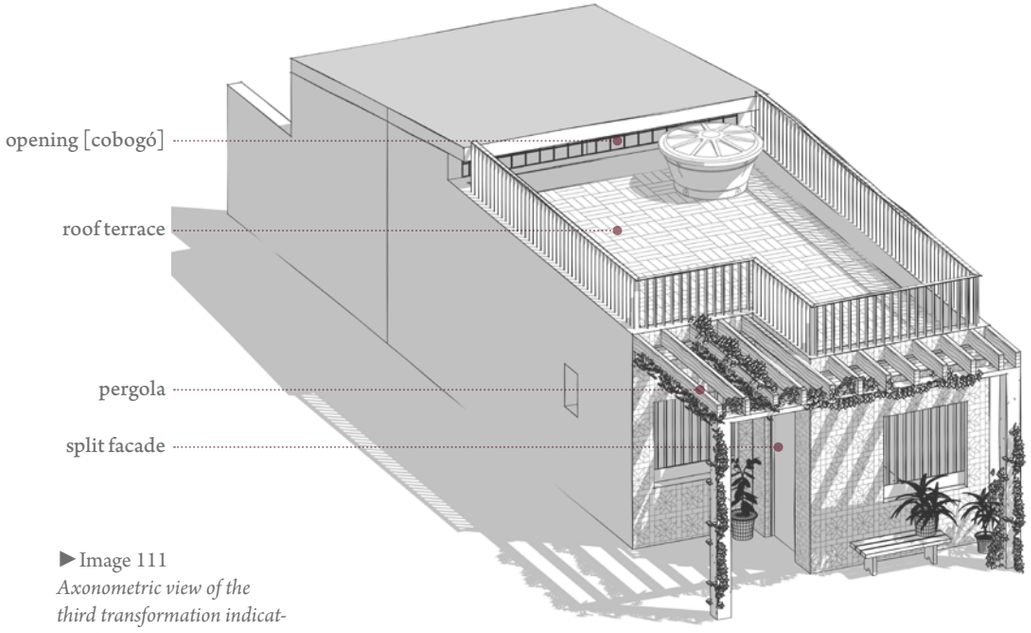


▲Image 110
Facade and axonometric view of the existing one-storey house

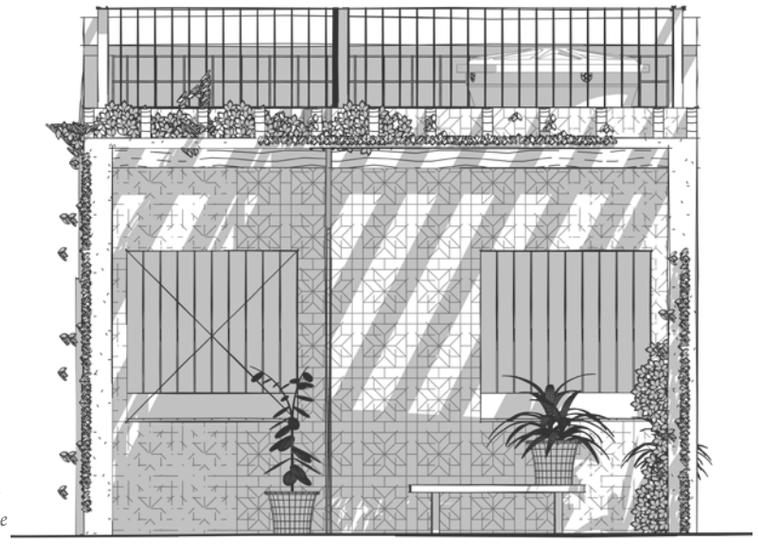
TRANSFORMATION 3: ADDED VALUE TO ONE STOREY HOUSES

This third transformation has different variations, starting from the basic remodel. Here, a tiled facade is added, the steel fence is removed, and a pergola is added. This could be the first step in improving the home. By creating a more social and open atmosphere under the canopy, it will bring the residents closer together by bringing them outside.

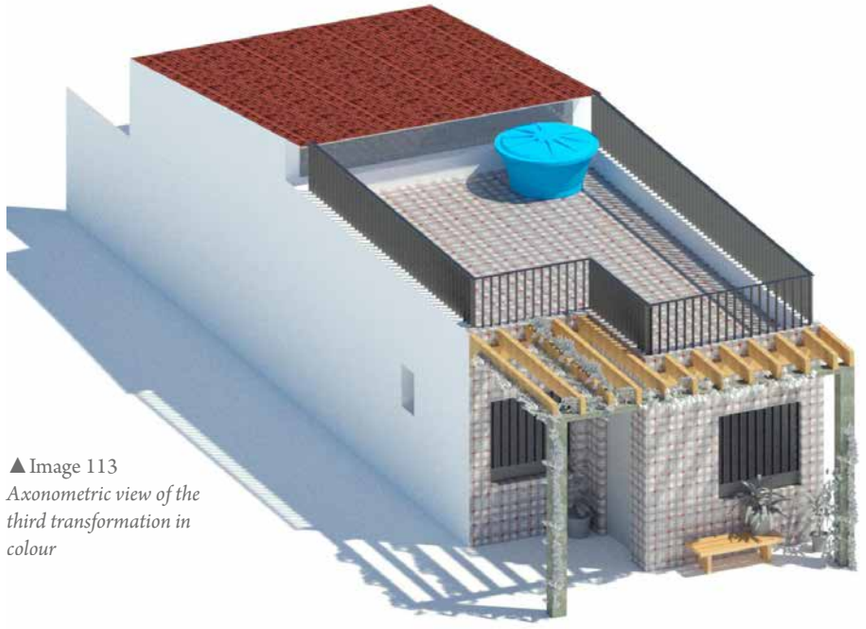
A second variation is a bit more elaborate, where the house is expanded towards the existing canopy part. By creating a split front facade, two windows are added, supplying better airflow through the house. The canopy is exchanged for a partially flat roof to place a water barrel, the other part becomes part of the pergola that spreads over the entire front facade. This could become a cozy little home for the elderly later in life. Those who don't need stairs and big roof terraces, but can enjoy sitting outside watching people in front of their own house.



▶ Image 111
Axonometric view of the third transformation indicating the advantages



▶ Image 112
Facade after the third transformation with a split facade and a roof terrace



▲ Image 113
Axonometric view of the third transformation in colour

The last, most expanded variation, is the one with the added rooftop terrace. Going through the first two steps of small interventions, the house is established after e.g. negotiating with the neighbours*. In this case, the neighbours enjoy the presence of the roof terrace while the residents of the one storey house can update their home with the addition of cobogó[1] underneath the roof to create a better wind flow through the house. Either way, this house will always remain one level based on the tradition of tiled or tin roofs.

*** AIR RIGHTS**

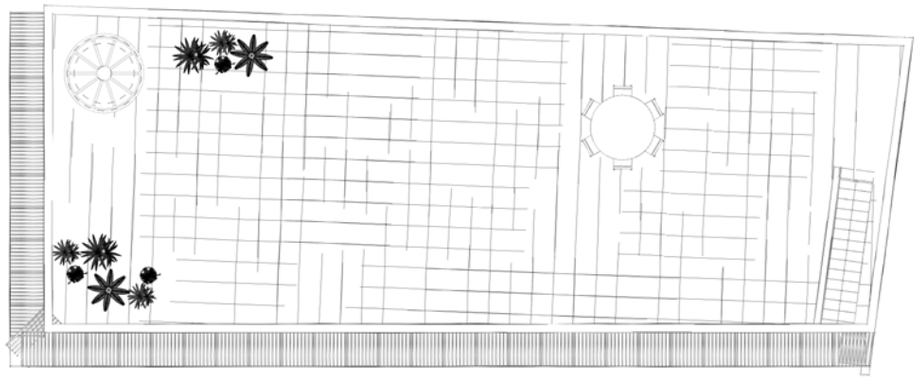
Air rights originate in New York. The term "air rights" refers to the right to occupy certain empty space. When you buy or own a house or piece of land, you not only have the right to the land and the existing structure, but also to the vertical space, the air, above the building. Therefore, it is not possible for your neighbour to simply decide to build a rooftop deck that extends into the airspace on your land. However, the property owner may choose to lease or sell their air rights. As urbanization leads to limited space, the value of a property's air rights can increase.[2]

In Ilha do Joaneiro, the possibility of introducing air rights could benefit numerous residents . The property owner selling his air rights could use the acquired funds to update his/her home. Meanwhile, the buyer can use those air rights to implement a roof terrace or to keep the space open for better ventilation.

[1] Delaqua, V. (2019, February 27). *Cobogos: A Brief History and Its Uses*.

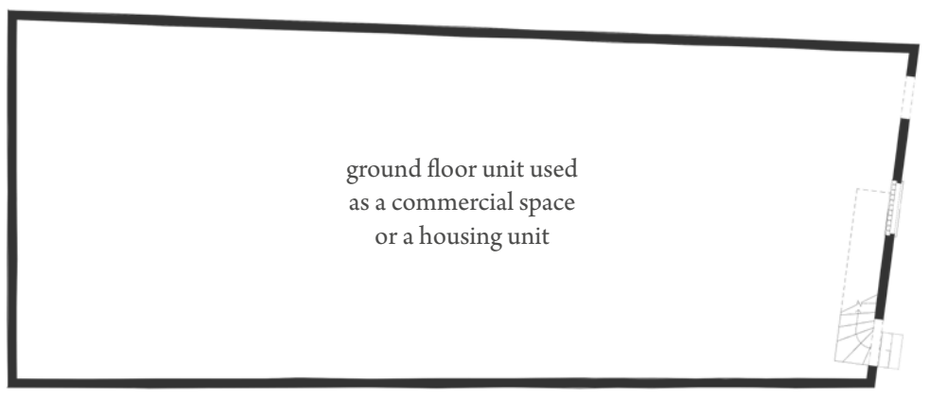
Cobogó = A compositional element, created in Recife, and present in the aesthetics of modern Brazilian Architecture. The leaked element brings in a way privacy to the user, despite the visual permeability. They are made of concrete, brick, ceramics or other materials.

[2] Frankel, M. (2020, February 28). *What Are Air Rights, and What Do They Mean for Developers and Investors?*

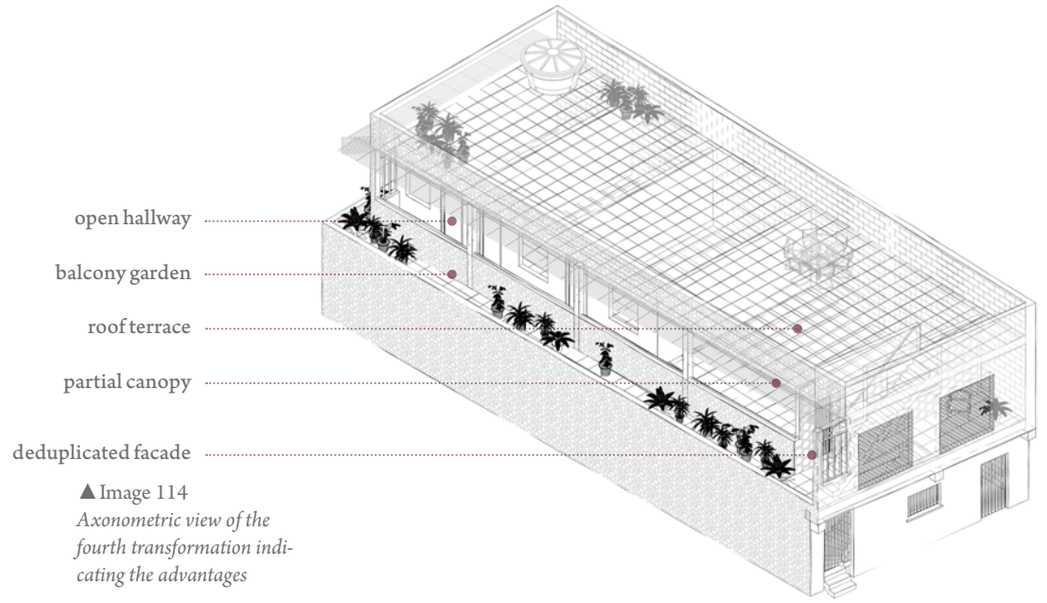


second level

first level



ground floor



▲Image 114
Axonometric view of the fourth transformation indicating the advantages

TRANSFORMATION 4: INTRODUCING THE BALCONY GARDEN

The fourth transformation is based on the idea/thought that every house should be able to add another level, regardless of what their neighbour might do. While there are no official rules of construction, there is a law of mutual respect.[1] Therefore, it should be decided to not install windows in side facades as they would open directly onto the neighbour's house. The favela is a small world and everyone knows each other, so they must come to peaceful agreements among themselves. Hence, it's common to leave a space of approximately one meter between each house.

In this typology we introduce a new floor plan. This floor plan exists of a hallway on one side of the building with the rooms on the other side. The hallway opens up to the kitchen and living room in the front of the house, and the hallway has an opening in the back of the building, as well as in the doubled front facade. This way it serves two different purposes, it is the circulation point for the family and it serves as a device that creates natural ventilation due to the open front and back.

It is the most compact and efficient way to achieve both goals and it allows anyone to add levels to their buildings.

[1] Veysseyre, S. (2017, September 14). *Case Study: The Unspoken Rules of Favela Construction.*

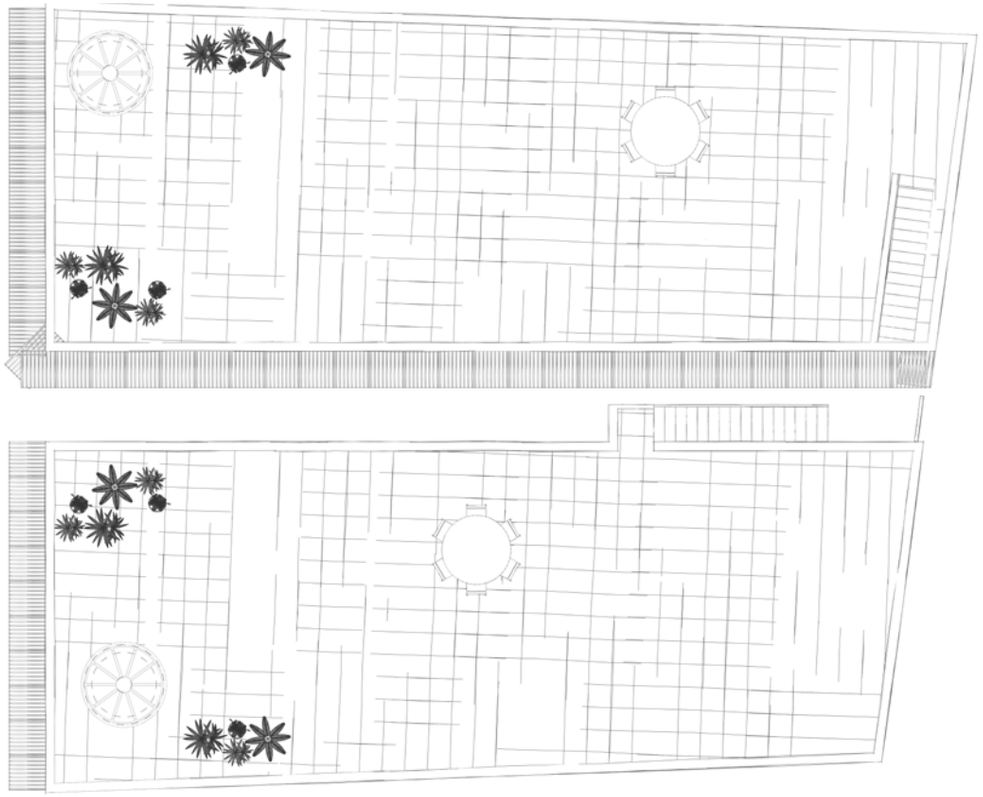
◀Image 115
Floor plans of the fourth transformation

ground floor

▶ Image 116
Floor plan of the ground floor level of the fourth transformation linked to a second building

first level

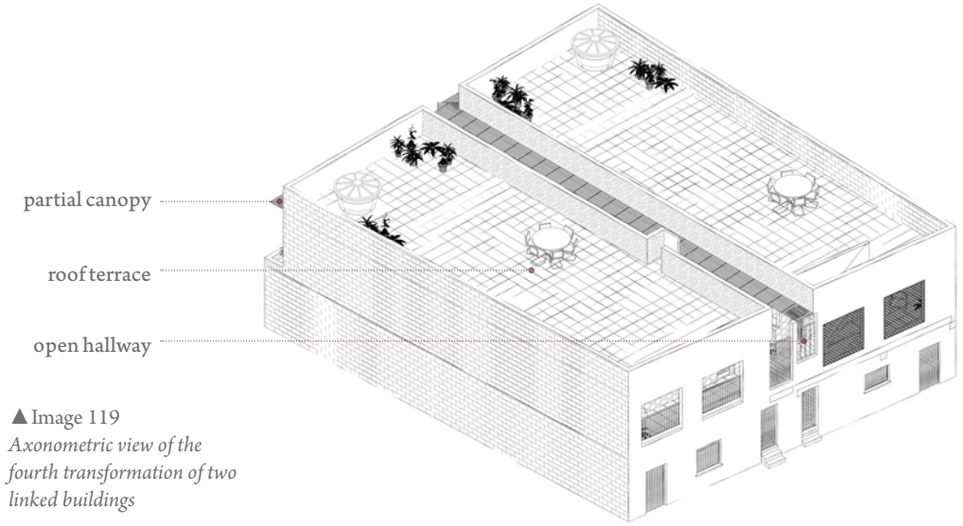
▶ Image 117
Floor plan of the first floor of the fourth transformation linked to a second building indicating the circulation and ventilation through the balcony garden



second level

▶Image 118

Floor plan of the second floor of the fourth transformation linked to a second building indicating the different roof terraces.



▲Image 119

Axonometric view of the fourth transformation of two linked buildings

By using this new typology, a new atmosphere is created in the favela. The balcony garden is a natural element to regulate privacy, where the residents are in control of how much is seen inside their homes by their neighbours. More privacy is achieved by a denser level of higher plants, or the opposite is true, with lower potted plants. Introducing these balcony gardens creates a softer boundary and less harsh edges of the houses. A certain interior urbanity arises.

In addition, the partial canopy gives a beautiful balance between openness and privacy, and creates more shadow in the homes. Therefore, a terrace type of vibe is created in the living spaces. However, the partial canopy is in no way an obligation.

The open space that originated from the balcony garden can contribute to the space needed for the staircase. This would be a pleasant change from the staircase being at the front of the facade as currently seen in a majority of the houses in Ilha do Joaneiro.

◀Image 120
View on the balcony garden on the first floor between two linked buildings

TYPOLOGY CHARACTERISTICS

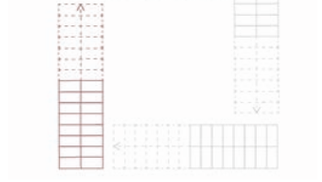
pergola

roof terrace

balcony garden

overhang

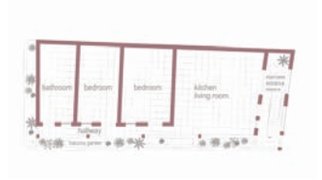
deduplicated facade



(dis-)placement stairs

side garden

split facade



floor plan

◀Image 121
Aerial view on Ilha do Joaneiro in its current state where green is seriously lacking

◀Image 122
Aerial view on Ilha do Joaneiro during the transformation and development of several lots in the community

GREENING OF A COMMUNITY

The evolution to a green community is possible through the use of different typologies. The first step is creating a system of side gardens and repeating it throughout the community. The next step would be implementing a new typology including balcony gardens which contribute to the green in the streets. Combine both typologies with street trees and vertical green, and a greener masterplan is conceived. Every single intervention provides the possibility for the residents to personalize the area they live in. Each have a hand in the landscape design of their private gardens, as well as the way they execute the vertical green.

The aerial view on the left page shows a possible outcome of how the community could grow and develop with the implementation of these interventions as said above.

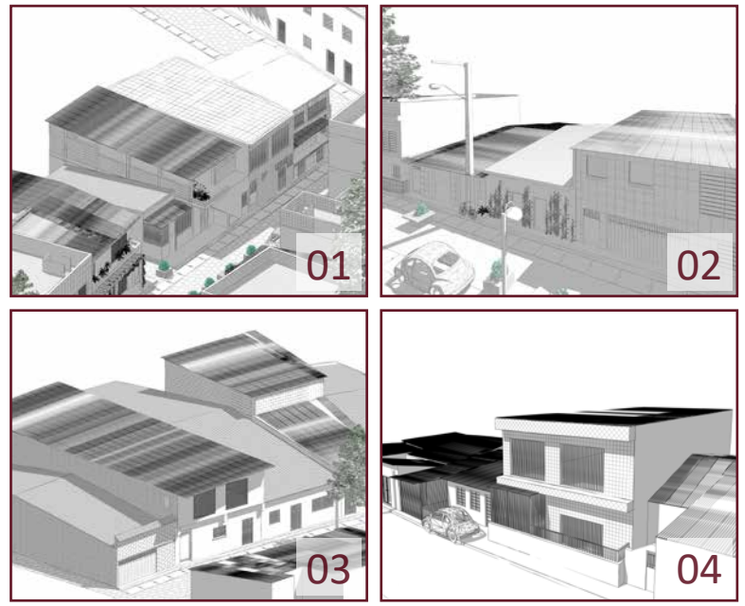
▶ Image 123

An ongoing expansion of a house in Ilha do Joaneiro

08

SCENARIOS

THE IMPACT OF ARCHITECTURAL TRANSFORMATIONS ON STREET SCAPE AND URBAN SPACE



▶Image 124
The first location close to the plaza of the Rua Nova to elaborate in scenarios

▶Image 125
The second location in the gallery of the Rua Nova to draw different scenarios off

▶Image 126
Location three at the entrance of the Rua Nova

▶Image 127
Location four on the right side of the gallery of the Rua Nova

SCENARIOS ARCHITECTURAL TRANSFORMATION

A prospective representation of how the neighbourhood could look is shown on the following pages. Four locations were chosen and split up into different scenarios. The various scenarios in each part of the street provide a different perspective on the possible growth and expansion of the community. Several options and issues come to light once going deeper into the development of the favela.

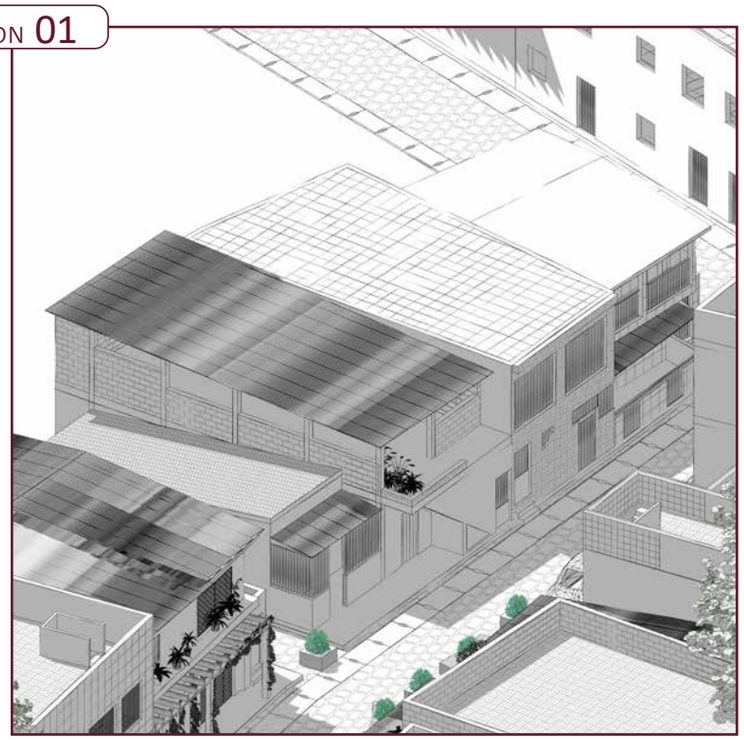
In the preliminary design research, a system of side gardens had been created. The first three locations on the map were chosen because they deviate from the system and are not able to implement the side gardens in the same way. Therefore, other solutions would need to be found. The interventions in these scenarios differ in scale, but they are still possible to be achieved by the residents.

Every scenario starts from the idea that the community will develop naturally in its own time and place. Keeping in mind, each resident has different amounts of available funds, if any, to spend on such developments.

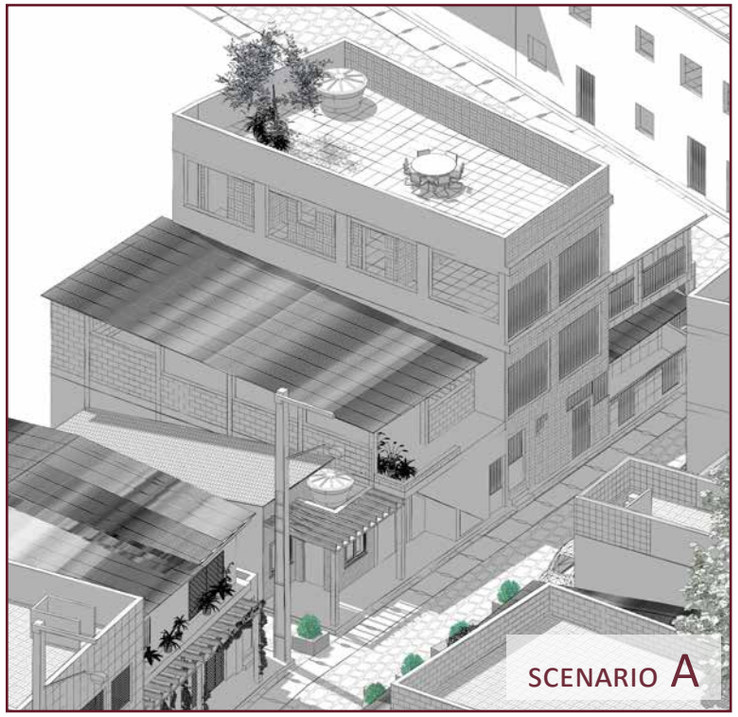
The fourth location features plots where the side garden system is possible, but that does not mean it will develop in that way. Therefore, new scenarios are made to show the opportunities these plots have if they transform differently.

◀Image 128
Map indicating the different locations where the scenarios are created

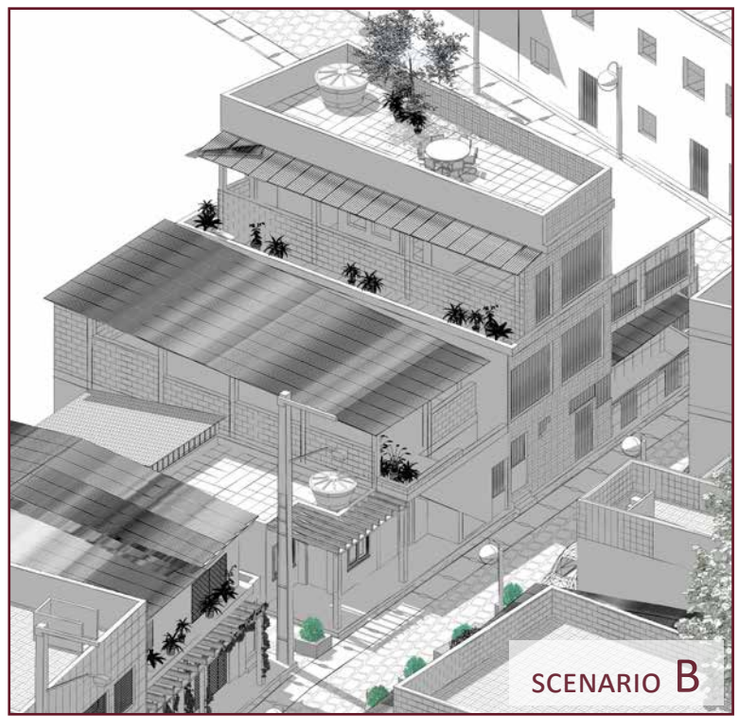
LOCATION 01



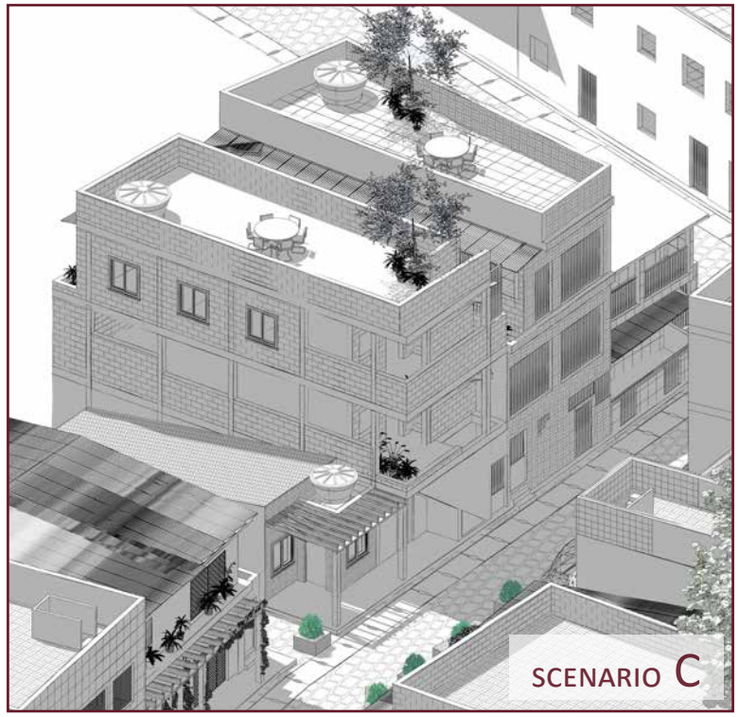
►Image 129
Axonometric view of the current state of the first location



►Image 130
Axonometric view of the first transformation in two houses



►Image 131
Axonometric view of an improved version of the first transformation in two houses



►Image 132
Axonometric view of an extensive transformation in three houses

Image 133 (next page)
Axonometric view of most elaborated transformation in three houses

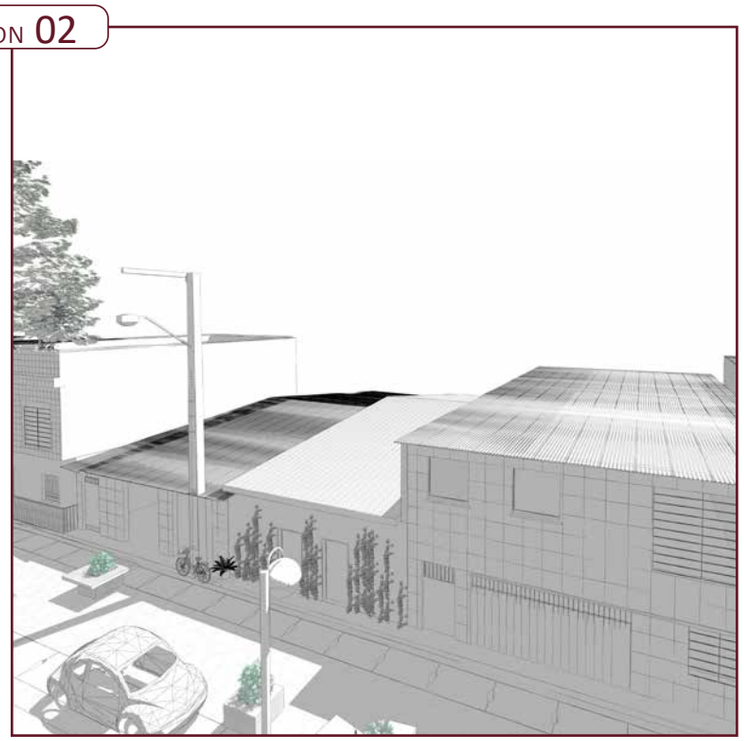
For the first location close to the plaza, three out of the four buildings have a second level. In **scenario A**, two families want to expand or renovate. The small, one storey house was bought by a new family who still had some remaining funds to renovate, and add a pergola and flat roof for a water barrel. This creates a small outdoor space for them to sit outside. The middle building would add another level and the family wants windows on the side wall. Their neighbours, however, do not agree to this addition, because it removes their ability to add another level to their own house. A solution for windows on the side wall needs to be found.

In **scenario B** a solution for the side windows is found. By using "transformation 4" of the house typologies, a retracted facade on the second level creates a barrier between both houses. Better airflow is created and with the addition of a small canopy, direct sunlight is prevented from entering the house. A more subtle relationship between exterior and interior is then created. In the mean time, the second left house negotiated with the family of the one storey house and bought their "air rights" (see House typologies 'Transformation 3'). This family use their new air rights to build a rooftop terrace on the side, so stairs are not needed. The sellers can invest the acquired money in fixing up their home.

Scenario C expands on a scenario where the two middle houses both expand around the same time or one after the other. Both want to make use of the retraction of the facade. The open space can be used to put plants on, creating small roof gardens on different levels. By mirroring the retraction, a bigger open space is created, allowing the air to flow freely through both homes.

The last **scenario (D)** examines the family of the second house on the left who bought the air rights to build a roof terrace over the corner building. A few years later, another family buys the second level on the second left building. In addition to building their home, they also add a rooftop terrace, but this terrace is completely private, which is not a problem since the first level family has their own terrace next door.

LOCATION 02

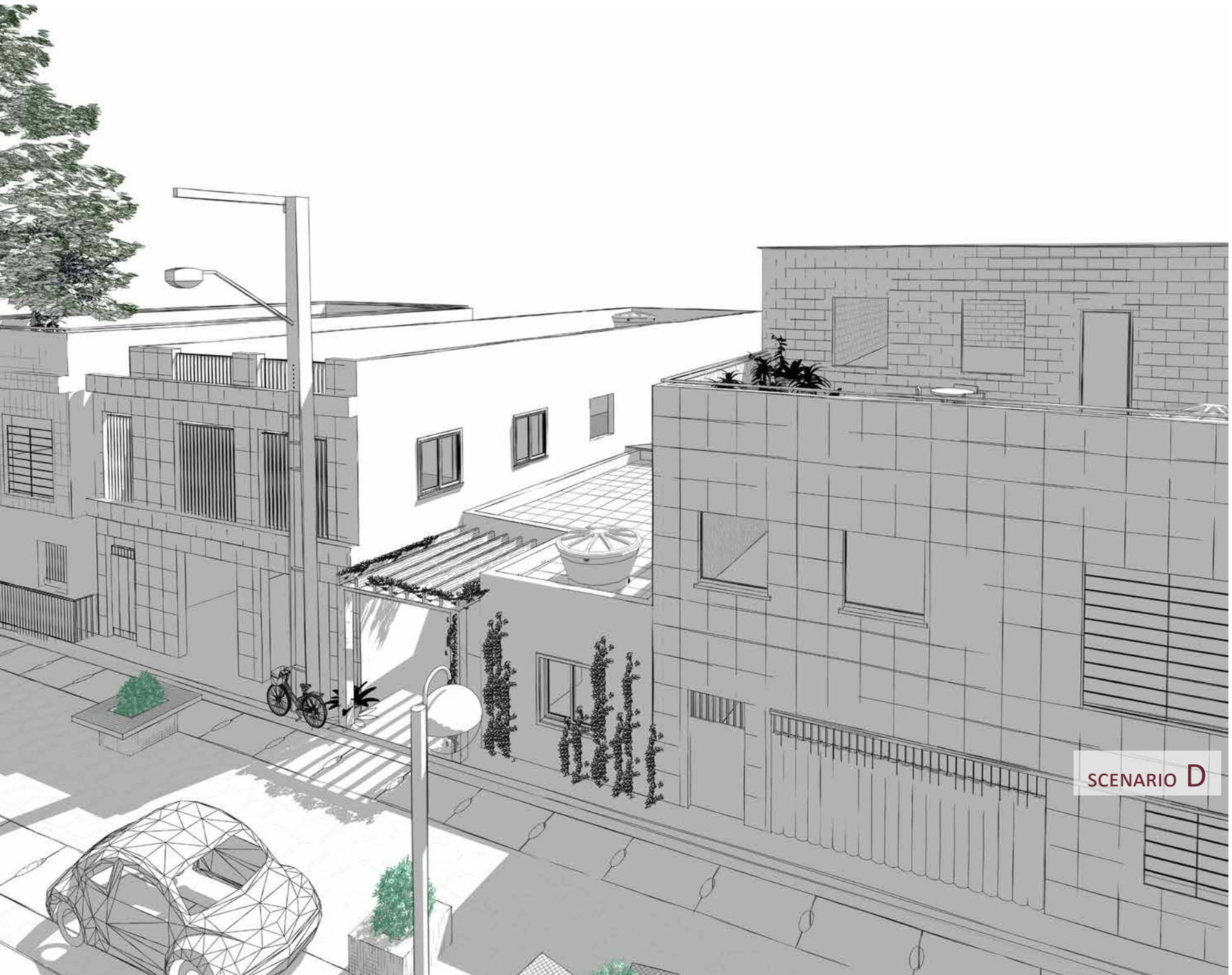


►Image 134
Axonometric view of the current state of the first location

►Image 135
Axonometric view of the first transformation in two houses

►Image 136
Axonometric view of an improved version of the first transformation in two houses

►Image 137
Axonometric view of an extensive transformation in three houses



The focus of this location is on the one-storey house. This house has a tiled roof, which often indicates that this family does not have the funds to expand. All scenarios start from the same assumption.

Scenario A is the finished result of negotiations between the small one-level house and the supermarket next door. Here, the supermarket had the desire to expand by adding a garden next door. They took the opportunity to negotiate the air rights. In exchange for the air rights, the residents of the small one-storey house got a new home on the first level above the supermarket. They could have a bigger home, or even two separate units could be created, one of which could be rented out. Side note: the garden can act as a bypass to the houses on the other side of the building block.

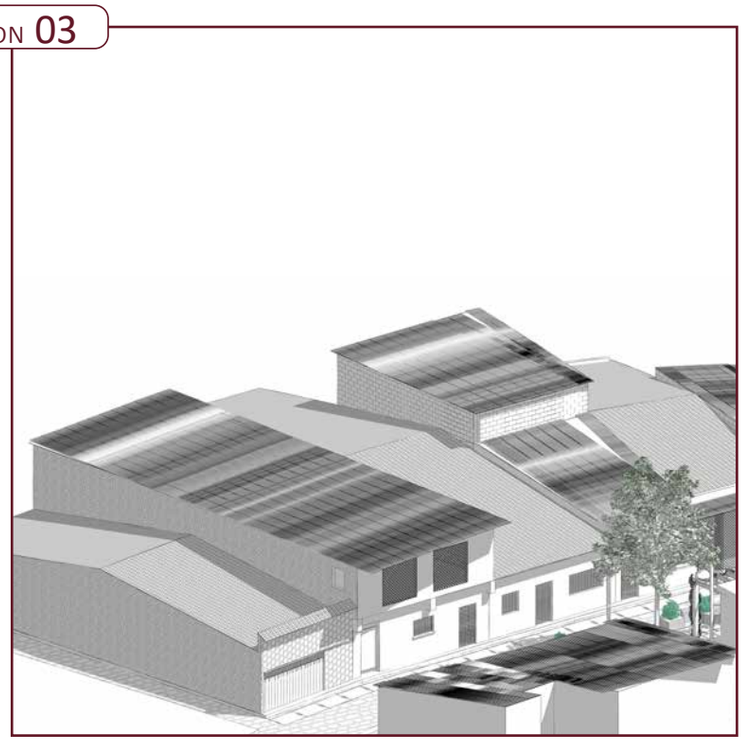
In **scenario B**, the kids of the family of the one-storey house outgrow the house and create a family of their own. They expand, buy, and build the level over the supermarket. The parents keep living in the one storey house but receive some money from their children to add a pergola to their house. This gives them an outdoor space where they can watch over their grandchildren play on the street.

The third **scenario (C)** continues with the older couple passing away and a new young couple buying the one-storey house. They add a flat roof to place a water barrel and their neighbours renovate the house on the right by adding another level. Their family is growing and they don't finish the terrace knowing that it will expand once again later on.

In **scenario D**, the neighbour on the right hand side of the one level building has bought the air rights over the house. The people living in the one-storey house now have some money to update their home . They decide on a split level facade, a pergola, and a terrace which provides them with the possibility to create a shed-like roof. This will then improve airflow through the building. The terrace is only being used by the right handed side neighbours as it has become theirs.

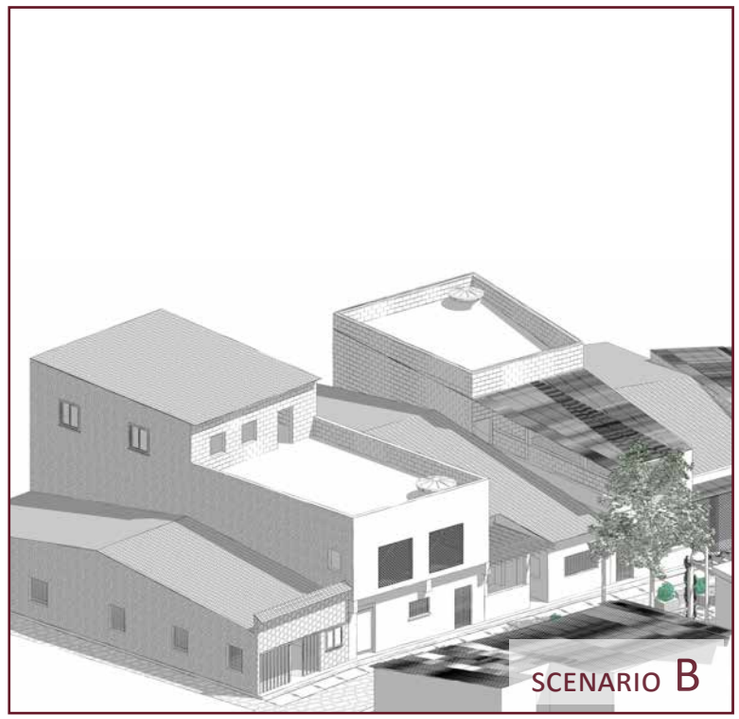
◀ Image 138
Axonometric view of most elaborated transformation in three houses

LOCATION 03



▶Image 139
Axonometric view of the current state of the first location

▶Image 140
Axonometric view of the first transformation in two houses



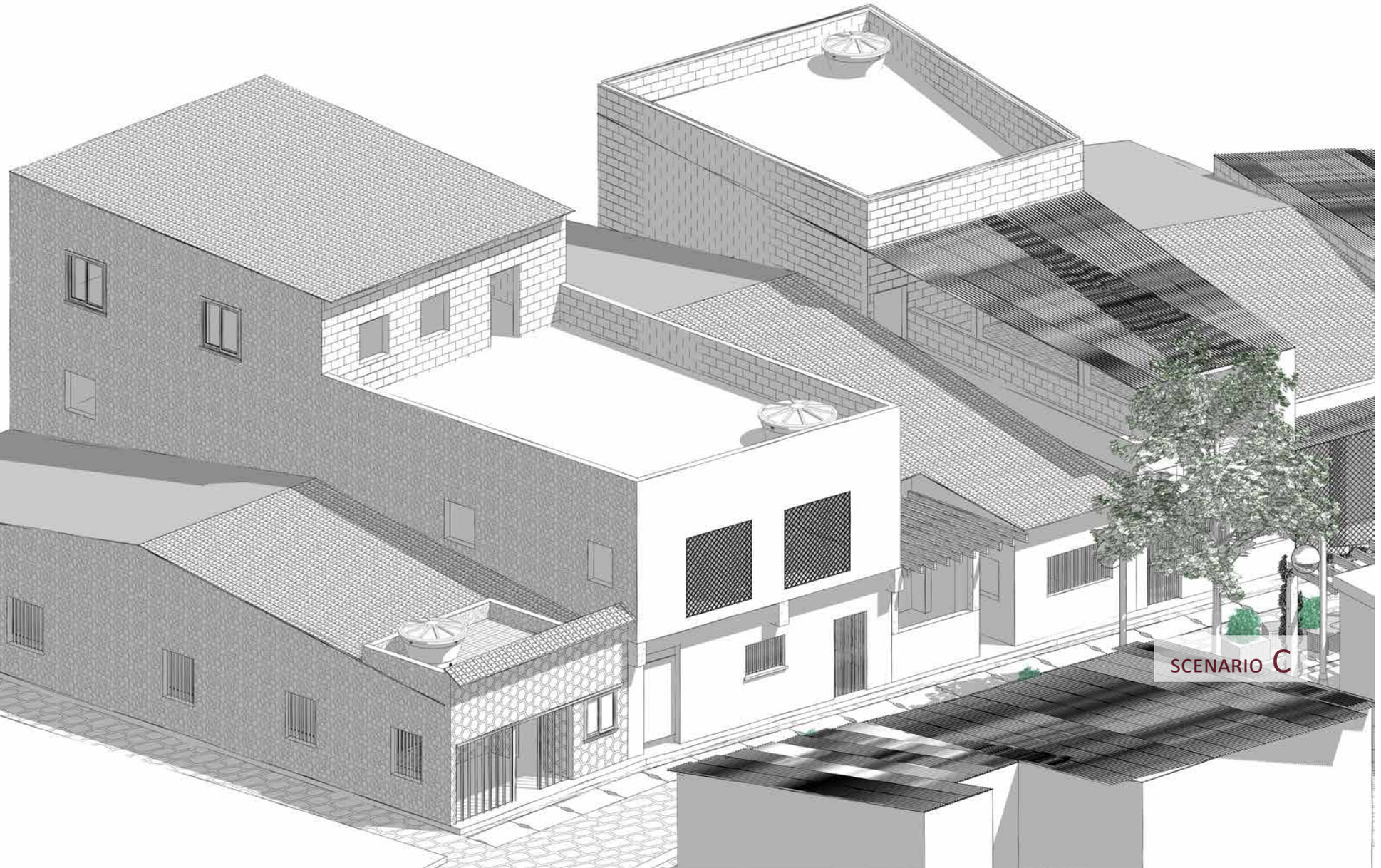
▶Image 141
Axonometric view of an improved version of the first transformation in two houses

The third location at the beginning of the Rua Nova, is limited to three scenarios with five smaller buildings. This location did not have the ability to implement the new side garden system. Although it has been said, tile roofed buildings don't have the funds to expand, ,but situations can change and create new possibilities.

In **scenario A**, the culture of tile and tin roofs is maintained. The tin-roof buildings expand with a roof- terrace to dry clothes. The middle tiled-roof building opens up a small part of the front facade to create an open room. This will generate better social interaction with the people on the street. These are small non-intrusive interventions that can be done with these buildings.

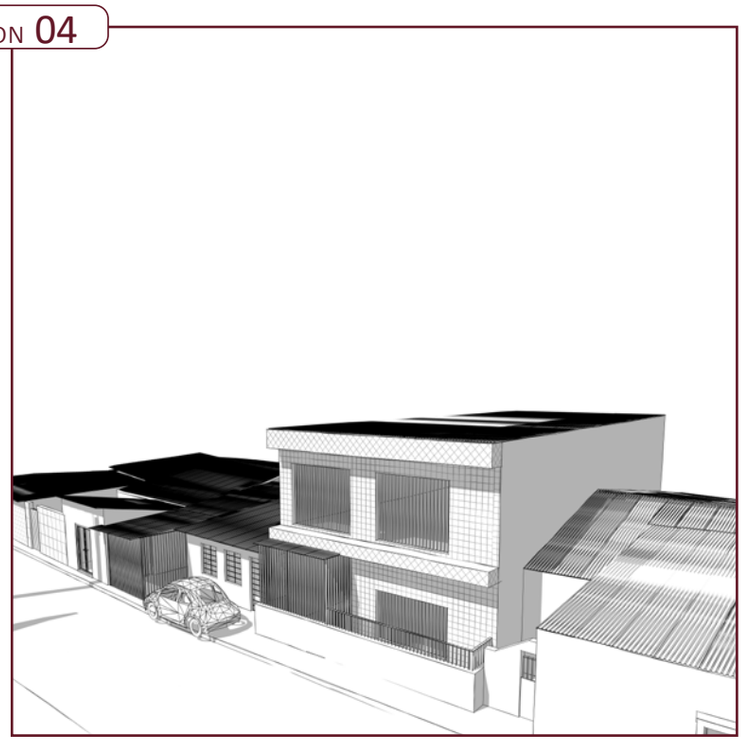
For **scenario B**, the expansions continues. The corner house replaces their gate with a steel fence, creating more eyes on the street and opening up their home to more social interactions. The house next door opts to add a half level in the back of their building. This helps ensure that people won't climb from the bordering house in the back onto their terrace. The fourth house expands with a balcony garden to increase ventilation.

The last **scenario (C)** takes place in the future where a new family buys the one-storey house. Small interventions could be the addition of a flat roof for a water barrel or the placement of a pergola instead of the tiled roof. This small courtyard could be used to dry the laundry. However, due to the half level expansions, these new families can not always expand with higher levels due to the presence of windows, therefore, the balcony garden is required.



◀Image 142
Axonometric view of an extensive transformation in three houses

LOCATION 04



▶Image 143
Axonometric view of the current state of the fourth location in the middle of the gallery

▶Image 144
Axonometric view of side garden system, the two middle buildings share a wall

▶Image 145
Axonometric view the transformation with a balcony garden, the two middle buildings do not share a wall

The fourth location contains plots where the side garden system was able to be implemented. However, this doesn't mean that the development will continue with this pattern, other scenarios are possible, as explored on these pages.

Scenario A is the finished result of the side garden system that was implemented on the center buildings. First, new levels were added, before part of the building was demolished to be transformed into a garden. The right outer building and the building with the pergola, both introduced a side garden into their design.

Scenario B took a step back and the residents of the left building next to the Açai-shop on the left, just added another level and a roof terrace for their convenience. To upgrade their new level, they made use of the balcony garden, opening up the space between their house and their neighbours on the right. Part of the open space was used to place a staircase towards the roof terrace.

In **scenario (C)**, the family on the left had a conversation with the family of the middle house. They chose to work together and add a pergola in front of both buildings. The middle house lost a part of their front garden, but in exchange they negotiated with the left family and were allowed to use the staircase in between both houses to reach their new roof terrace.

CONCLUSION

There is no certainty on how the community will develop. The lack of available funds for several families will play a major role in the development of the buildings.

In the first place, people who do have the funds, have different options on how they could transform their houses. Smaller interventions like placing a pergola, or adding a roof terrace are one possibility. Bigger interventions like adding another level with an overhang or with a floor plan based on the balcony garden transformation, is another. They could also opt to implement the side garden system if they have the resources and place for it.

Otherwise, people who have little to no resources to update their homes, mostly residents of tiled roof houses, could always opt to negotiate with neighbours. By selling their air rights, they are able to acquire some funds. If selling is not possible, the exchange of goods or services is also a possibility, for example giving air rights in exchange for a flat roof with a water barrel.

The interventions on the scale of the public space, requires more support and participation by the community leader and government agencies.

◀Image 146
Axonometric view of the transformation with a balcony garden, the two middle buildings share a staircase

Brasilia Teimosa

CHAPTER III

TOOLBOX URBAN TRANSFORMATIONS

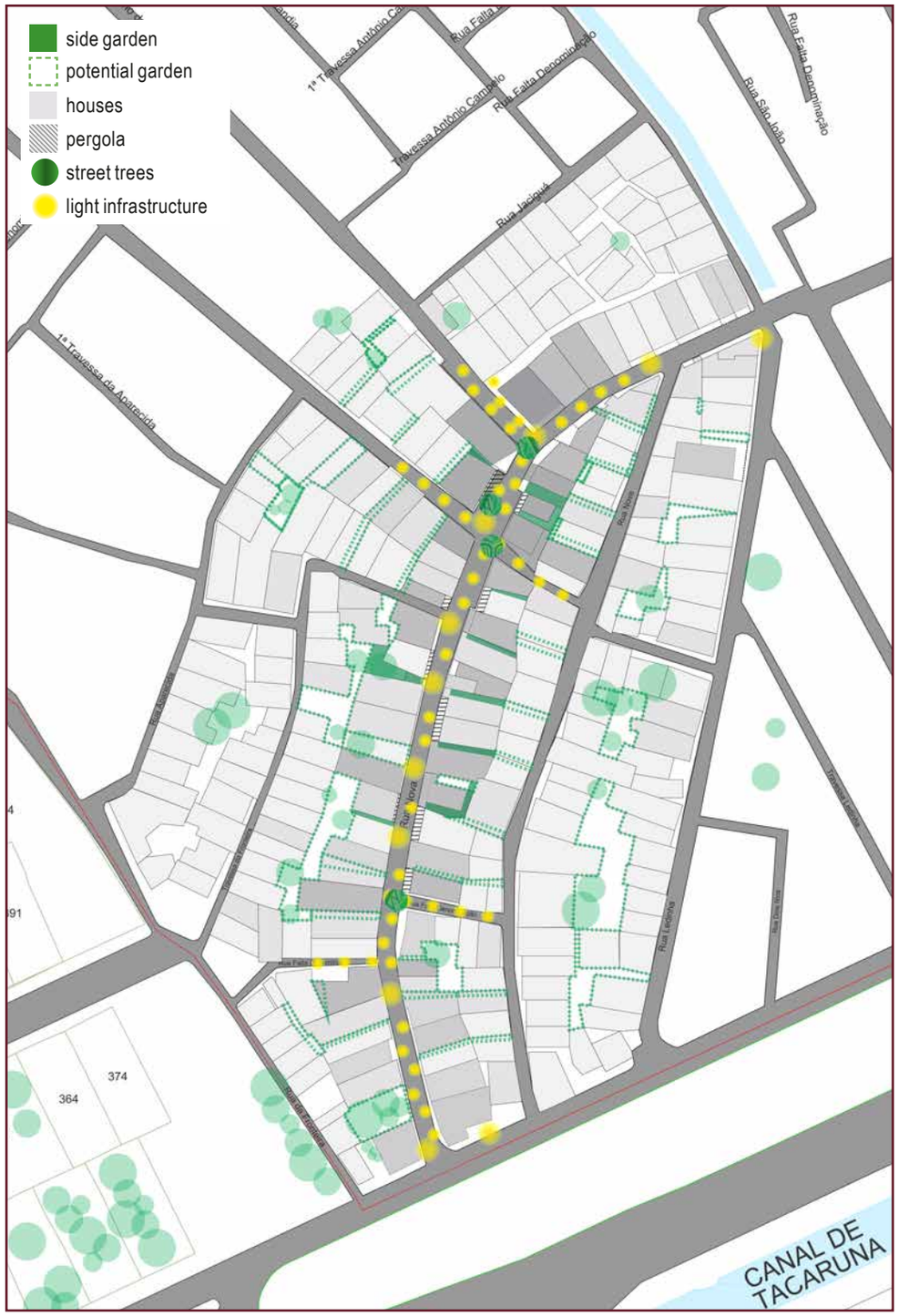
III TOOLBOX URBAN TRANSFORMATIONS

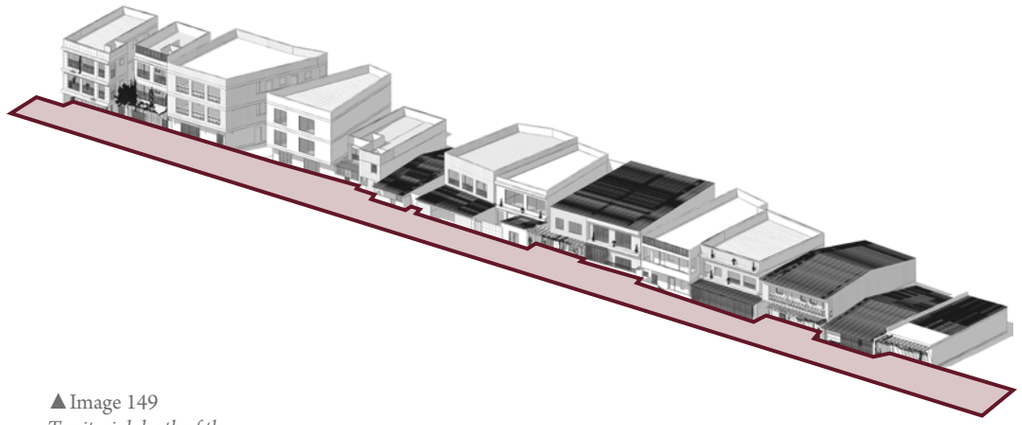
DESIGN FROM RESEARCH

The following design proposal is made continuing on the previous analysis and design research. All interventions done in the design process, start from a point where renovations or changes were already going to be made. However, this design wants to show a better or at least another way of making those changes instead of falling back on how the building is constructed right now. There is no order in which these interventions need to be done. They could start by repairing the sewage system and adapt the design proposal to end with the expansion of a house. They could have also started with the expansion of the house and end with the placement of urban greenery. Each and every intervention depends on the acts done by the residents and community leader in their own time and space.

Image 147 (previous page)
Secondary street in Brasilia Teimosa

Image 148 (previous page)
Bike shop across from Dona Binha on the Rua Nova





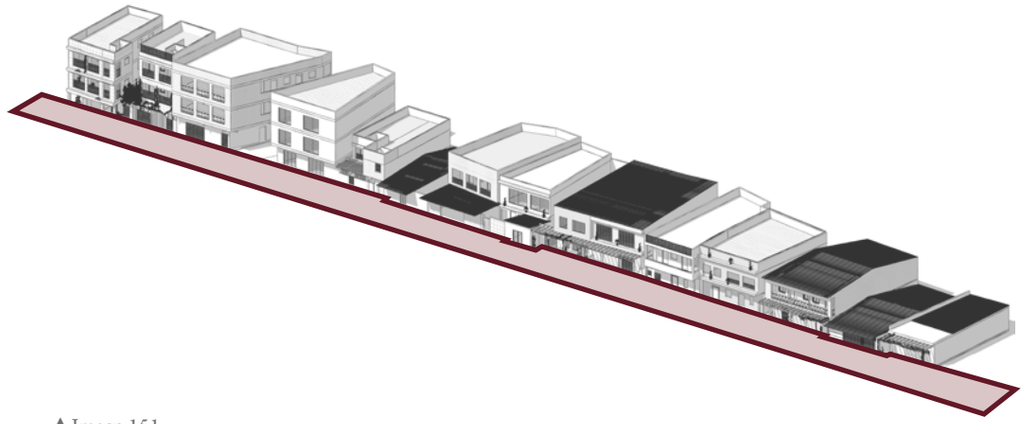
▲Image 149
Territorial depth of the Rua Nova after the new development with the acceptance of the current state

Because we start with the current state of the favela, we are able to accentuate the depth of the small corners of the street. In the past, residents took a part of the sidewalk, and claimed it as their own. In this scenario, we accept the past, but will prohibit the commissioning of new pieces. Due to the acceptance of the current state, a more dynamic streets cape is created. Small moments become part of the street life, generating a more vibrant street. Therefore, the current situation will be the starting point for the new design proposal, acknowledging the restriction of the future commissioning of public property.

◀Image 150
Map of the new development

◀Image 152
Map of the new development after the restitution of the sidewalks

◀Image 153
● *Areas on the ground floor to give back to the community*



▲Image 151
Territorial depth of the Rua Nova after the new development with the restitution of the sidewalk

However, another scenario could be where we don't accept the appropriation of the sidewalk by the inhabitants. Thus, by renovating or expanding a house, they have to give the public space back to the community and in doing so, broadening the street. The new typology using an overhang or a pergola makes this scenario completely feasible to open up more public space, while still keeping enough m^2 on the higher levels for living. The ground floor should still focus on being used as commercial space or space for services.

A benefit of this scenario is opening up the street, creating more open space for pedestrians to use. However, this would also result in an almost tunnel-like atmosphere with a sequence of pergolas and overhangs. Consequently, creating less opportunities for nooks and crannies to create small moments, which could be considered a disadvantage. Another consideration should be for the reluctance of the present residents to give back some of their property to the community.

DESIGN PROPOSAL

The design proposal follows the path of a person walking through the Rua Nova, starting south and going north. We'll pass several landmarks in the street such as a supermarket, or the little açai-shop. Every stop is marked by a number, as seen on the map on the left side page and has a before and after image showing a possible result of the development of the Rua Nova. The images also include the icons of the interventions done in the development. However, this design is not final, it's still transforming. Many more interventions can be done when the community grows and evolves in the upcoming years.

The circle indicating the intervention " ❶ does not show the order in which the interventions are to be done. This number is to connect with the icon on the top right of the page. Information about the icon is found in the toolbox, as you will see on the following pages. This toolbox refers back to the different segments in the second chapter 'II Analysis & Design Research' at the beginning of this book.

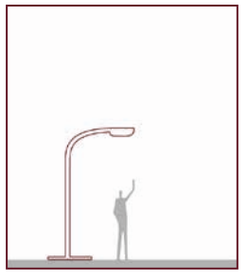
This design is one of the possible scenarios of expanding. Building a house takes time and money. That is why a house is often built over several generations. A floor is laid, columns are erected which are extended upwards, and a thin tin roof is placed on top. This marks the end of this stage in construction and where the next in line should finish the building. Constructing the roof with tiles is not a sign of wealth, but means there is not enough money to build another level. Thus, this design has tried to primarily intervene with the houses constructed with thin tin roofs. However, family conditions can change, and the design can take note and adapt with them.

◀Image 154
Axonometric view of the path indicating locations of transformation

TOOLBOX

Shared street [Chapter I . 04 Safety]

There is no distinction between the space for pedestrians, cyclists, or motorists. In this design, sidewalks are demolished up to the facade. The roadbed is newly paved with a permeable concrete water drain on both sides of the street, in between, cobblestones are added with enough spacing for grass to grow.

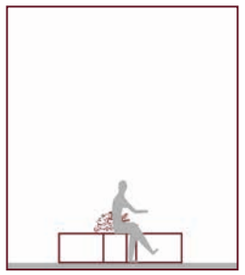


Light infrastructure [Chapter 1 . 04 Safety]

Lighting fixtures should be placed as such that no dark zones are present on the street. The height of the poles should be on a human scale, no higher than 4.5m. The bulb is faced down towards the street for more safety at night.

Green infrastructure [Chapter 1 . 05 Green infrastructure]

Street trees should be located where they can fully develop without a lot of maintenance. They provide shade and bring more biodiversity to the street.



Street furniture [Chapter 1 . 06 Street furniture]

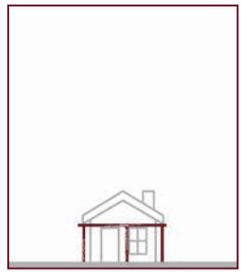
New street furniture is added. Planters and benches connect the facades on both sides of the street and compliment the mixed ground-floor use. All street furniture is manufactured in concrete, finished with tiling, and complimented with greenery.

Residential spaces [Chapter I . 07 Typology]

New typologies are introduced in this design. Ground floors should anticipate the inclusion of mixed commercial use. Suggested heights are determined by the analysis. The purpose is to expand, while controlling the densification.

Commercial spaces [Chapter I . 02 Functions]

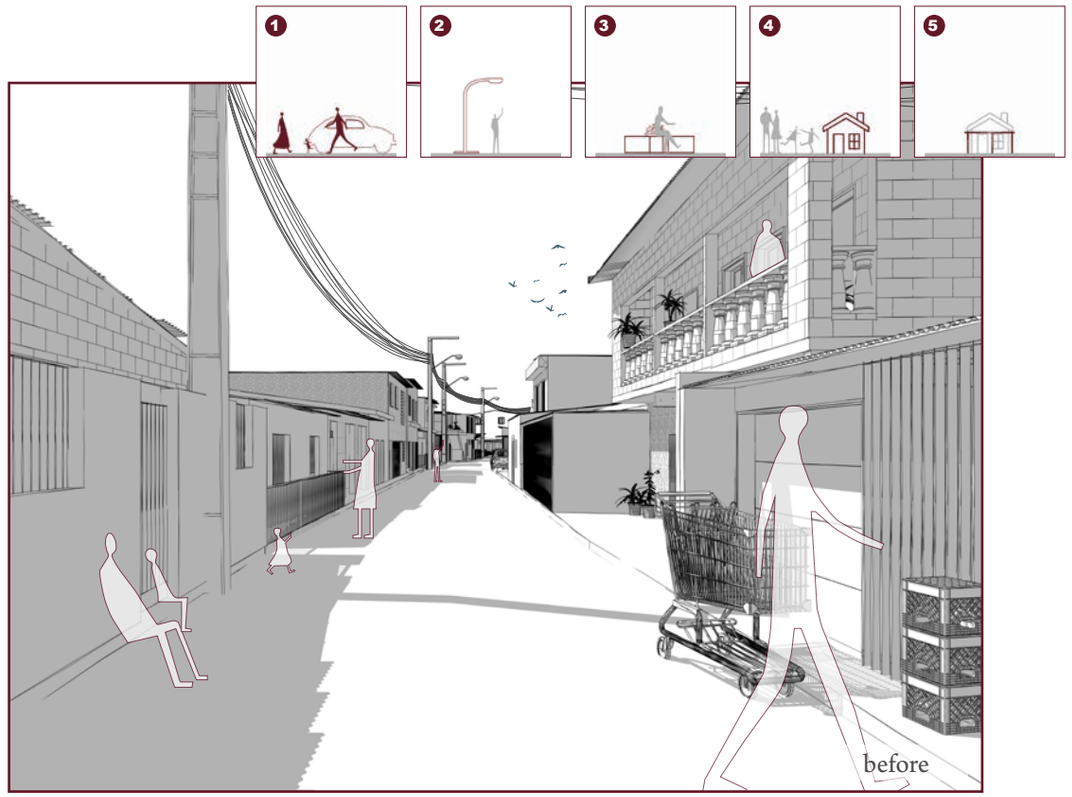
All empty and/or inaccessible spaces can be converted and rented out as commercial spaces, or spaces for services. Thus, creating a greater diversity and attracting more outsiders into the community so it can flourish.



Pergola [Chapter I . 07 Typology]

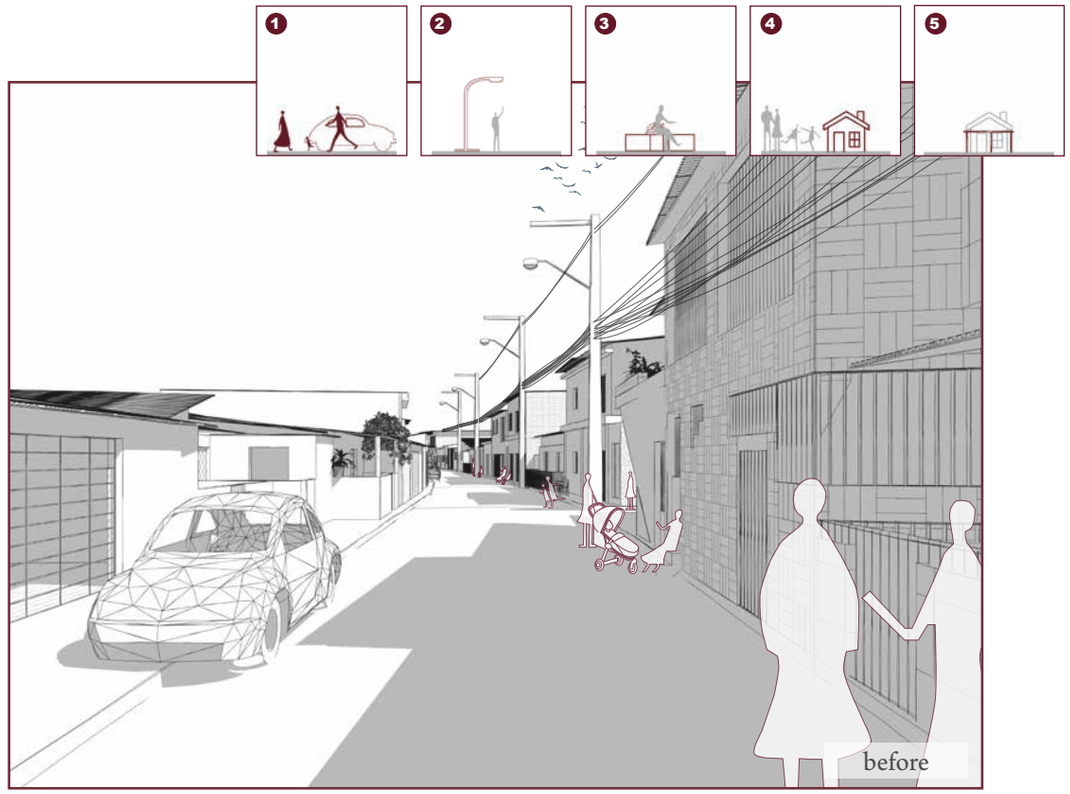
To create more shade and cool down the ground floor facade, pergolas are added to the buildings. Vertical gardens grow on the structure, creating a greater biodiversity. The pergolas serve as a connection between the overhang of ‘Typology1’; creating a vibrant space where the community can gather and expand thir social connections.

01

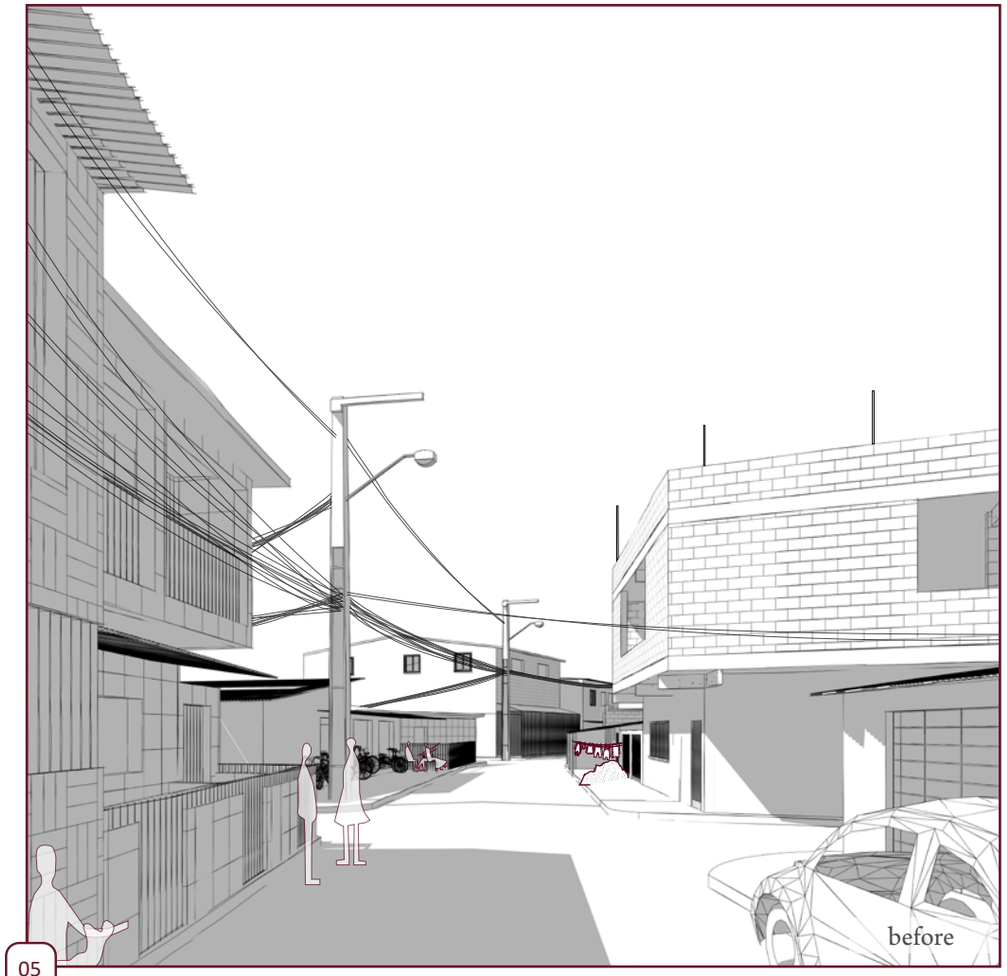


02

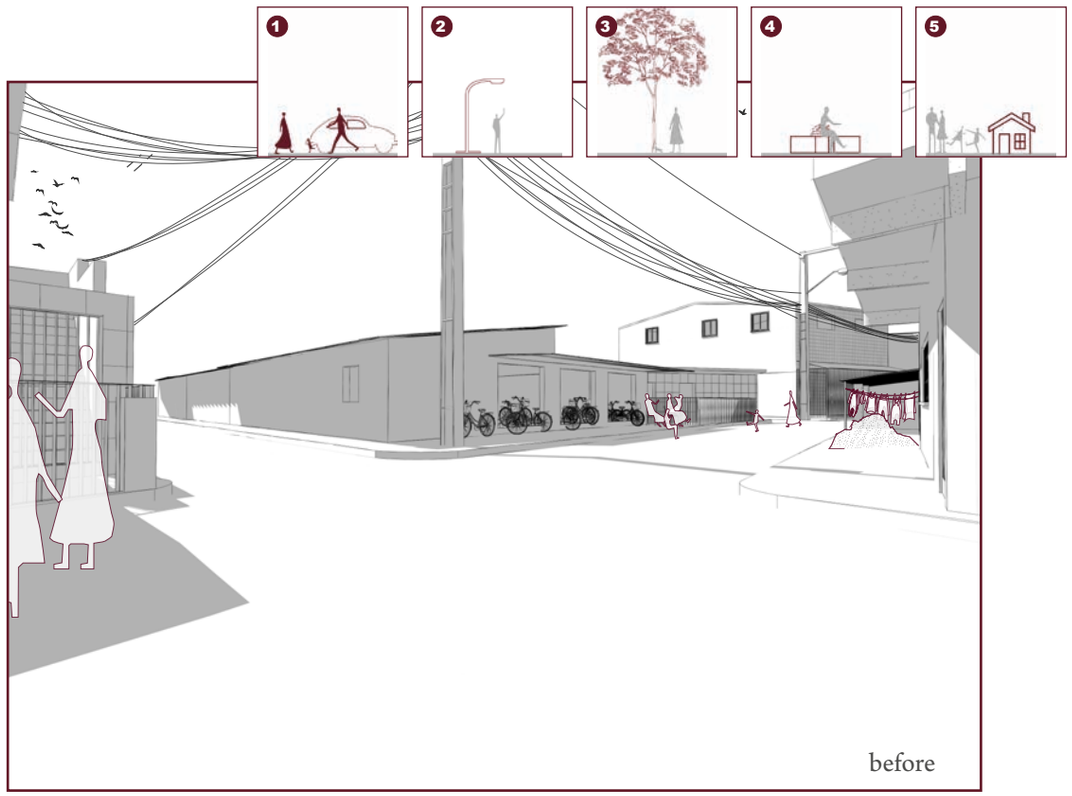
03

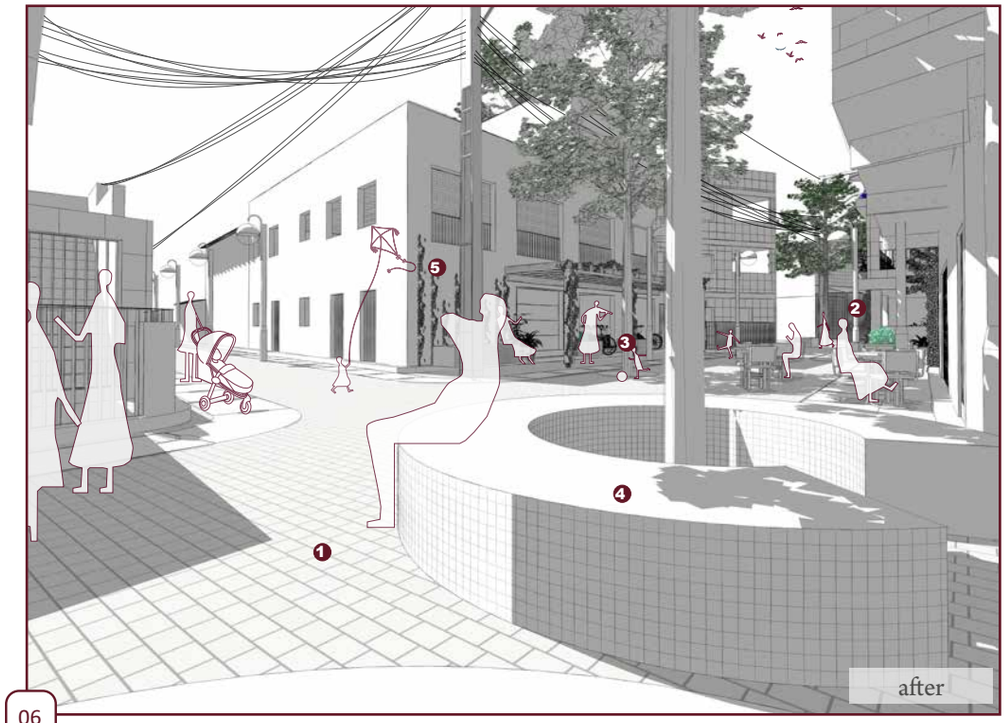


04

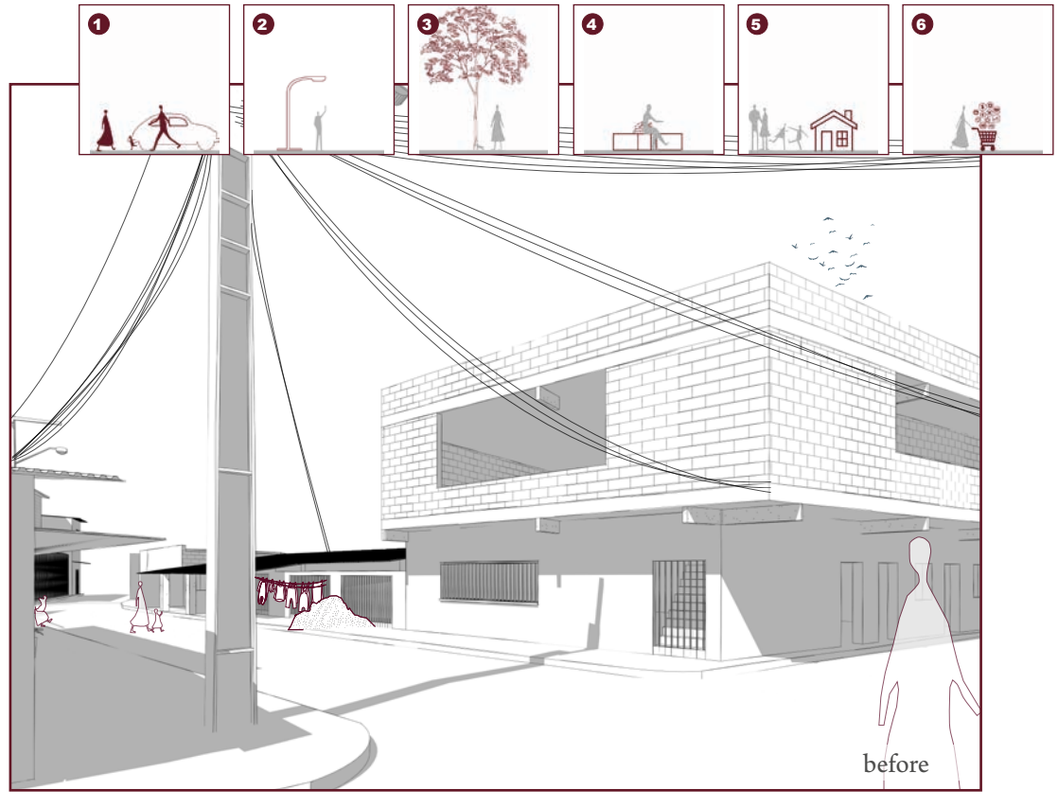


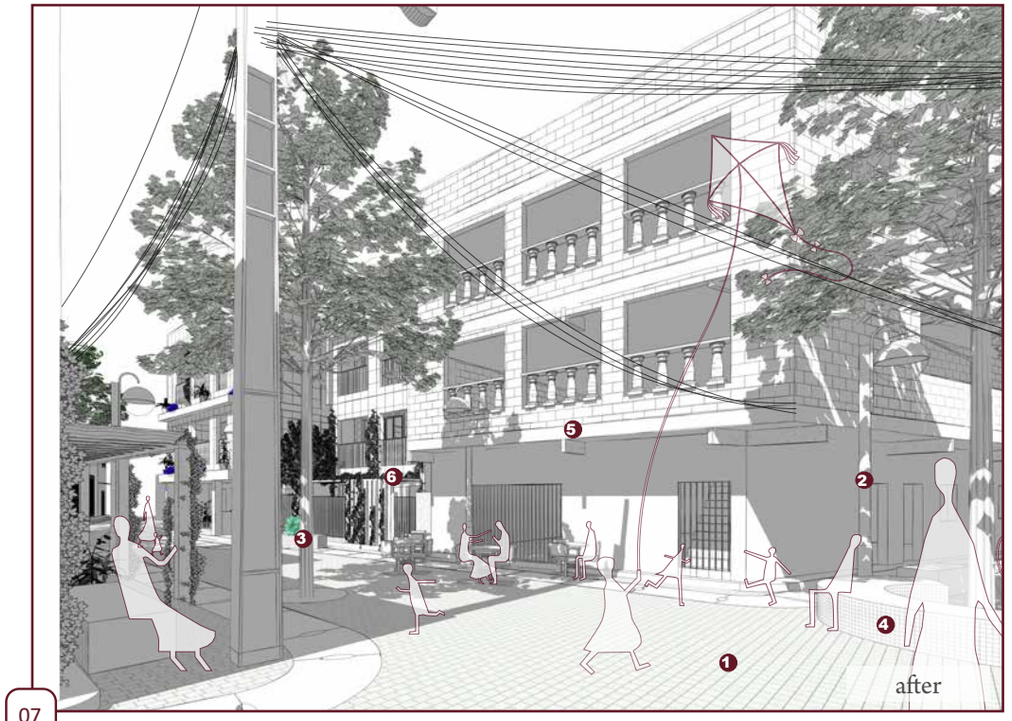
05



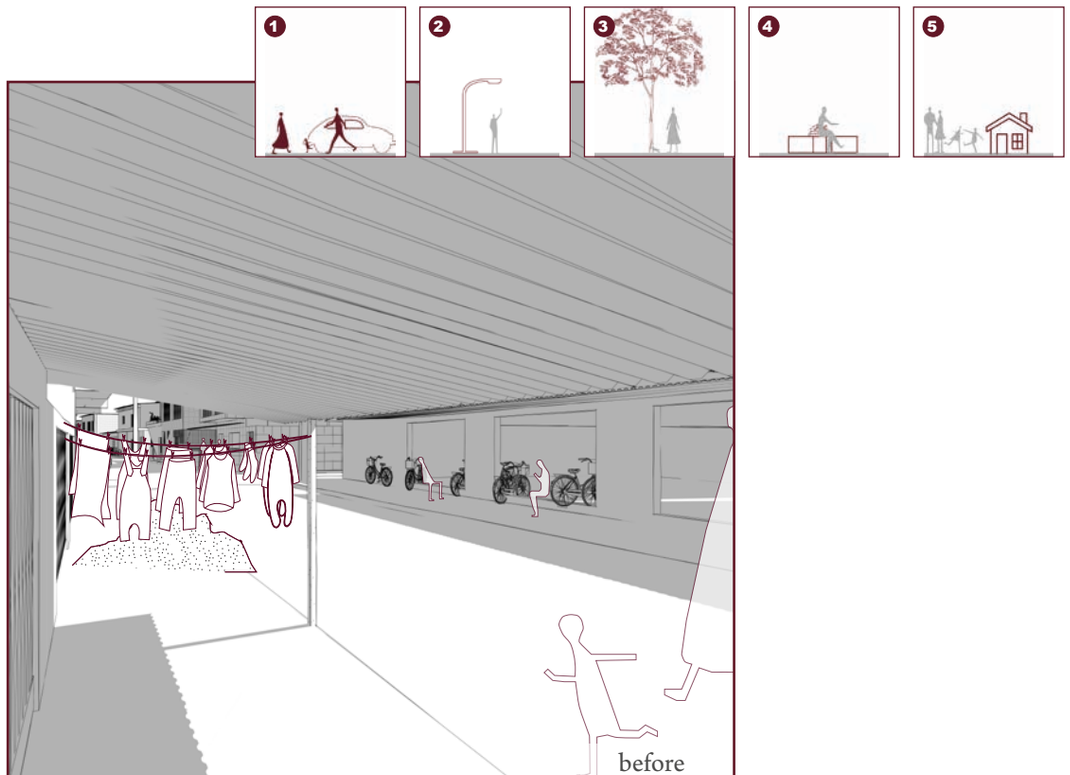


06

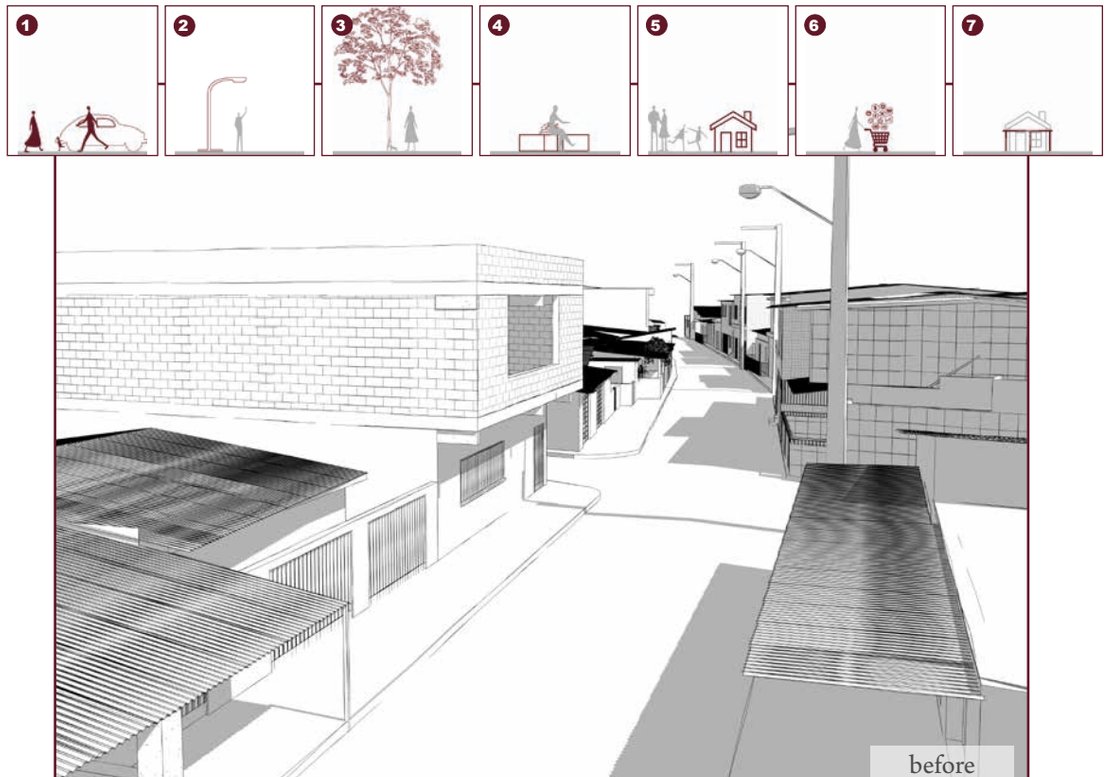




07



08



09

CONCLUSION

The community has been stuck in their traditional way of building. With the absence of a decent toolbox to use, residents build their homes the way it suits themselves. The community leader thinks in a practical way about the public space, looking to do as little as possible maintenance of the streets. All of this results in a highly dense, low rise, fully paved favela without any focus on comfort and basic living conditions.

The design proposal strives for a greener, more vibrant community where people have better social interactions and become part of the street. Comfort is a priority, as well is safety. Therefore, the design proposal focuses on dispersing residents over new dwelling units, thus decreasing the density. Because of the spreading of families, more open space is created, resulting in the possibility to implement green areas. Green infrastructure contributes to the mental and physical health of the residents, thus improving the living standards and comfort. The evolution of the street to a shared space, discourages motorists and focuses on pedestrians. Together with new light infrastructure and the commissioning of empty ground floor spaces, a safer feeling is created. The shared space attracts people investments and spending and creates a more vibrant street.

Because all interventions are people oriented, the favela gets personalized. The garden design and draft of vertical green on the facades, the option to manufacture and personalize their own benches, and the finish of facades and balcony terraces are all examples of personalizing. All personal interventions contribute to the social life and interaction between the residents. Thus involving the people in the street life, where they become part of the street and community.

▶ Image 155
Construction workplace at the beginning of the Rua Nova

CHAPTER IV

RECOMMENDATIONS

IV RECOMMENDATIONS

This last chapter summarizes the set of tools created through the analysis and design research. Two sets of recommendations are set up to use as a toolbox when residents decide to make changes to the environment they live in. A first set of recommendations consists of systemic mechanisms. These recommendations are intangible assets. This means that the asset lacks a physical substance. These recommendations are more acts that will be of an influence on the second set of recommendations consisting out of the physical assets or elements.

Therefore, the systemic mechanisms are to be consulted before continuing with the physical elements. So as the community leader has the function to act as a mediator when residents want to expand or renovate, he also has the final say in urban interventions of the public space. The recommendations of systemic mechanisms for building renovations follow the order given in this document, while the recommendations on systemic mechanisms for urban transformation are regardless of an order.

The second set of recommendations, the physical elements, are elements used during the transformation. This thesis wants to be an inspiration on how the physical elements are to be used in a more proper way for the community to benefit more from the transformations. There is no order to these recommendations.

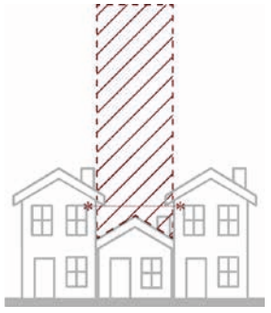
◀Image 156
Narrow street in center of Ilha do Joaneiro

mediator

dwellings

development

house typologies



air rights

commercial functions

shared street

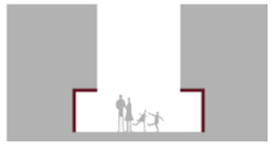
social functions

SYSTEMIC MECHANISMS FOR HOUSING TRANSFORMATIONS

1. When you decide to expand or renovate, talk to the community leader about the possibilities, rules and regulations.
2. Let the community leader play the part of mediator during negotiations or before transformations.
3. Invest in comfort. Provide approximately 23m^2 of living space per person. Thus encourage the development of more dwellings.
4. Restrict the building height to no more than three levels, roof terraces excluded, depending on the density level of the area.
5. Make use of the density diagram for systematic development in the different street zones.
6. Work with different house typologies of transformations. Look at the best options per case, separately. Allow for not restricting future transformations of possible neighbours.
7. Negotiate with neighbours about selling or buying air rights to improve one's house.
8. Rent out or commission empty ground floor spaces to be used for a commercial purposes or services, and improve the economy in the community.

SYSTEMIC MECHANISMS FOR URBAN TRANSFORMATIONS

1. When the road needs an upgrade, choose cobblestones with a grass grout instead of concrete.
2. When the sewage pipes needs replacement, choose to remove the sidewalks and convert the street into a shared street focused on pedestrians.
3. Bigger open spaces should be used as a kind of plaza where multiple events can take place; for example, a market, a small concert, community barbecue, etcetera...
4. Reduce parking spaces in the street, and encourage parking at the entrance of the community at the Avenida Governador Agamenon Magalhaes. Create a safer street focused on pedestrians.
5. Limit motorists in the community. Regulate delivery hours.



overhang

covered entrance

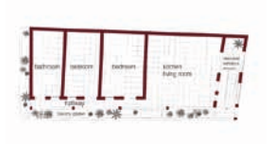
roof terrace

pergola

vertical garden

side garden

balcony garden



floor plan

split facade

light infrastructure

street furniture

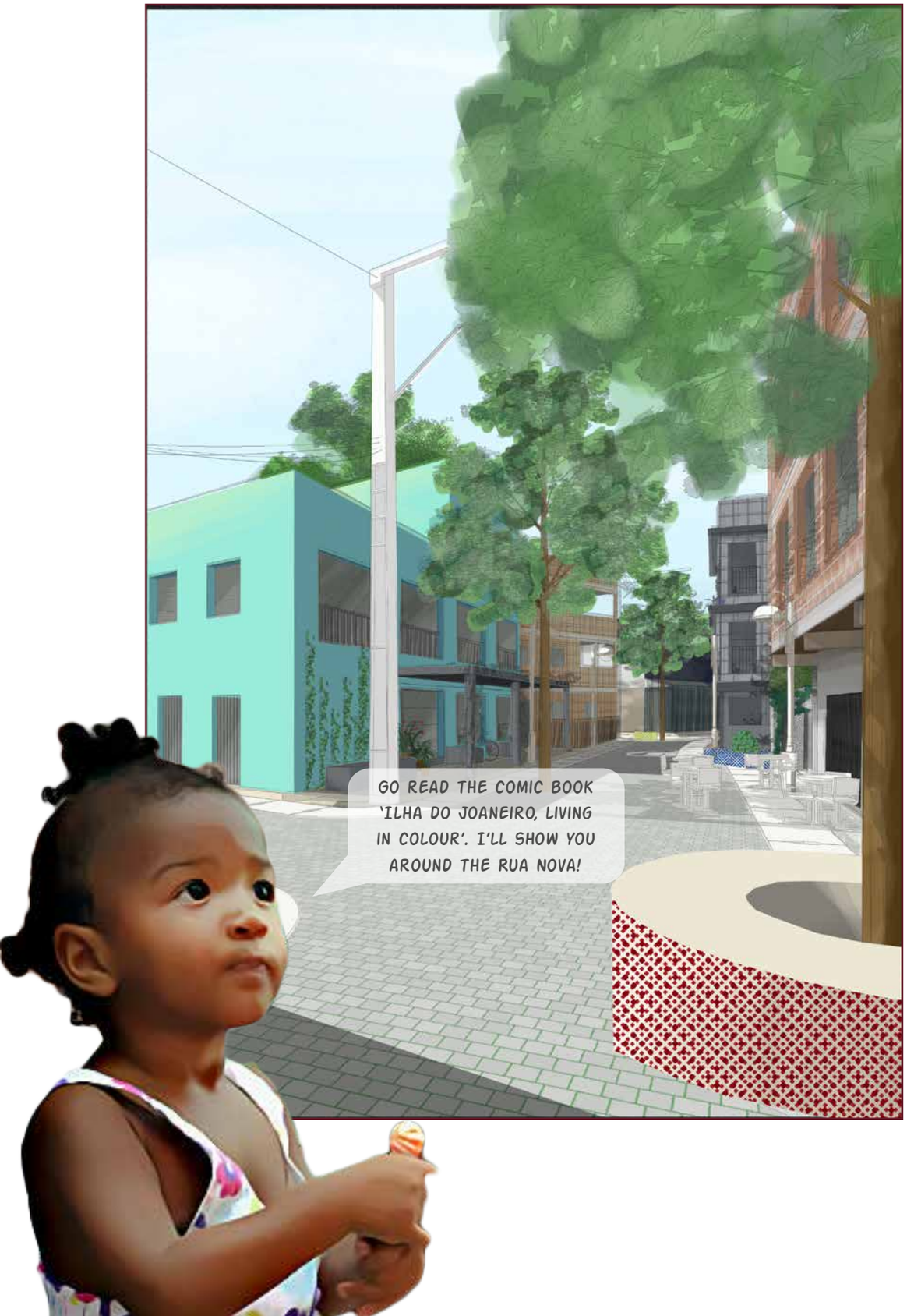
street trees

PHYSICAL ELEMENTS FOR HOUSING TRANSFORMATIONS

1. Boost social interaction in the shared street by making small moments through the use of overhangs or pergolas.
2. Create more shade closer to houses using overhangs or pergolas.
3. Encourage the use of covered entrances that could also serve as balconies at the street side, to create more eyes on the street and increase the feeling of safety and social interaction.
4. Add a roof terraces on the top floors to dry clothes or organize gatherings on the weekends.
5. Personalize and insulate the house better with the use of vertical gardens consisting of planters and climbing plants that require little maintenance.
6. Plant several gardens throughout the community. A better wind flow is created and the heat island effect is lessened. Improve the health of the community through greenery.
7. Motivate the implementation of balcony gardens to increase natural ventilation. Use the floor plan as guidance for new transformations.
8. Create small outdoor spaces by making use of a split facade to enhance social interaction and safety, e.g. more eyes on the street.
9. Use smaller interventions when less resources are available based on the house typology of transformations.

PHYSICAL ELEMENTS FOR URBAN TRANSFORMATIONS

1. Invest in light infrastructure on a human scale to increase safety and to give character to the street 'as a place'.
2. Implement street furniture to create comfort and reduce traffic. Create a mold for a twig bench. Manufacture the twig bench in concrete. Personalize the bench with tiling in bright colours.
3. Plant street trees at the location where they can fully develop to define the space and create shade.



EPILOGUE

TITLE EXPLAINED

From living in the grey to living in colour.

The title can be split apart in two sayings. 'Living in the grey' and 'living in colour'. A dual definition used as an expression for the thesis and the community.

" living in the grey"

Stone upon stone, grey cobblestones, concrete slabs, brick walls. The future of Ilha do Joaneiro looks grey. The future of the residents looks grey. Unless they decide to not live in the grey and to instead open up their minds to improve the conditions they live in by using this thesis as their toolbox.

"Living in colour"

A burst of yellows, reds, blues, and greens. Trees, flowers, plants, tiles, cobblestones, people. A spark of emotions, sparking life into the people. The thesis' toolbox provides interventions encouraging calm, positivity, and happiness. Through materials, texture, and people, a vibrant, stimulating and colourful community is formed, boosting the community in every possible way.

BIBLIOGRAPHY

Ali-Toudert, F., & Mayer, H. (2005, March 11). *Numerical study on the effects of aspect ratio and orientation of an urban street canyon on outdoor thermal comfort in hot and dry climate.* Building and Environment, 41(2), 94–108. Retrieved March 2020, doi:10.1016/j.buildenv.2005.01.013

Ali-Toudert, F., & Mayer, H. (2006, November 15). *Effects of asymmetry, galleries, overhanging façades and vegetation on thermal comfort in urban street canyons*. Solar Energy, 81 (6), 742-754. Retrieved March 2020, doi:10.1016/j.solener.2006.10.007

Ahern, J. (2013). *Urban landscape sustainability and resilience: the promise and challenges of integrating ecology with urban planning and design.* Landscape ecology, 28, 1203-1212. Retrieved March 2020, doi: 10.1007/s10980-012-9799-z

Arretche, M. T. S., Vazquez, D. A., Fusaro, E., Centro Brasileiro de Análise e Planejamento. Centro de Estudos da Metrópole, & Brazil. Secretaria Nacional de Habitação. (2007). *Capacidades administrativas, déficit e efetividade na política habitacional.* Sao Paulo, Brazil: Centro de Estudos da Metrópole / CEBRAP.

Banerjee, B., Acioly, C., Gebre-Egziabher, A., Clos, J., & Dietrich, K. (2014). *Streets as Tools for Urban Transformation in Slums: A Street-Led Approach to Citywide Slum Upgrading* . Retrieved January 2020 from https://www.citiesalliance.org/resources/knowledge/publications/streets-tools-for-urban-transformation-slums-street-led-approach

Becker, S. (2017, September 14). *Minha Casa, Nossa Cidade: Brazil's Social Housing Policy & The Failures of the Private-Public System.* Retrieved January 2020 from https://www.archdaily.com/504114/minha-casa-nossa-cidade-brazil-s-social-housing-policy-and-the-failures-of-the-private-public-system

Blocken, B., & Carmeliet, J. (2004). *Pedestrian Wind Environment around Buildings: Literature Review and Practical Examples.* Journal of Thermal Envelope and Building Science, 28(2), 107–159. Retrieved February 2020 from https://bwk.kuleuven.be/bwf/projects/annex41/protected/data/KUL%20Oct%202004%20BGInf%20A41-T3-B-04-2.pdf

Bowler, D. E., Buyung-Ali, L., Knight, T. M., & Pullin, A. S. (2010). *Urban greening to cool towns and cities: A systematic review of the empirical evidence.* Landscape and Urban Planning, 97(3), 147–155. Retrieved March 2020, doi: 10.1016/j.landurbplan.2010.05.006

Branchevereniging VHG - *handleiding Het Levende Gebouw.* (2019). Retrieved March 2020 from https://onlinetouch.nl/vhg/branchevereniging-vhg---handleiding-het-levende-gebouw#/19/

Brown, R. D. (2010). *Design With Microclimate: The Secret to Comfortable Outdoor Space* (2nd None ed.). Washington, DC: Island Press.

Carvalho Costa, G. (n.d.). *Cartografia Histórica :: LABTOPOPE*. Retrieved December 2019 from http://m.labtopope.com.br/cartografia-historica/

Catalytic Communities. (n.d.). *Call them Favelas*. Retrieved from https://catcomm.org/call-them-favelas/

De Baere, M., De Smet, E., Eyckerman, M., Pellens, B., Dierckx, S., & Vanhoutte, L. (2019). *Special Zone of Social Interest, The community of Chié.* Antwerp, Belgium: Author.

Delaqua, V. (2019, February 27). *Cobogos: A Brief History and Its Uses*. Retrieved March 2020, from https://www.archdaily.com/875130/cobogos-a-brief-history-and-its-uses

Dellenbaugh, M. (2017, January 23). *The physical and social normative properties of street furniture.* Retrieved June 2020, from http://www.hackingurbanfurniture.net/research/the-physical-and-social-normative-properties-of-street-furniture/

De Schiller, S., & Evans, J. M. (1996). *Training architects and planners to design with urban microclimates.* Atmospheric Environment, 30(3), 449–454. Retrieved March 2020, doi: 10.1016/1352-2310(94)00139-1

Eyckerman, M., & Dierckx, S. (2019). *Chié, the revival of an informal district.* Antwerp, Belgium: Author.

Frankel, M. (2020, February 28). *What Are Air Rights, and What Do They Mean for Developers and Investors?* Retrieved May 2020, from https://www.fool.com/millionacres/real-estate-investing/articles/what-are-air-rights-and-what-do-they-mean-cre-developers-and-investors/

Gehl, J. (2011). *Life Between Buildings.* Retrieved January 2020 from https://books.google.be/books/about/Life_Between_Buildings.html?id=X707aiCq6T8C&redir_esc=y

Gehl, J., & Rogers, L. R. (2010). *Cities for People* (First Edition). Washington, DC: Island Press.

Global Designing Cities Initiative, & National Association of City Transportation Officials. (2016). *Global Street Design Guide* (2nd None ed.). New York City, New York: Island Press.

Haas, G. (2010, July 5). *James Rojas: The City as Play.* Retrieved April 2020, from https://drpop.org/james-rojas-the-city-as-play/

Hou, J., Spencer, B., Way, T., & Yocom, K. (2015). *Now Urbanism: The Future City is Here* (1st ed.). New York, NY: Routledge.

Jacobs, J. (2009). *The Death and Life of Great American Cities* (Reissue ed.). Amsterdam, Netherlands: Sun-Trancity.

Klemm, W. (n.d.). *Clever and cool: Generating design guidelines for climate responsive urban green infrastructure* (Thesis). Retrieved April 2020 from https://research.wur.nl/en/publications/clever-and-cool-generating-design-guidelines-for-climate-responsi

Lafortezza, R., Carrus, G., Sanesi, G., & Davies, C. (2009). *Benefits and well-being perceived by people visiting green spaces in periods of heat stress.* Urban Forestry & Urban Greening, 8(2), 97–108. Retrieved April 2020, doi: 10.1016/j.ufug.2009.02.003

Lea, J. (2019, May 28). *Vertical Gardens - the Ultimate in Organic Architecture.* Retrieved April 2020 from https://leadesign.com.au/architect/vertical-gardens-the-ultimate-in-organic-architecture/

Magalhães, F., & Di Villarosa, F. (2012). *Slum Upgrading: Lessons Learned from Brazil*. Retrieved January 2020 from https://books.google.be/books/about/Slum_Upgrading.html?id=v7F-2DwAAQBAJ&printsec=frontcover&source=kp_read_button&redir_esc=y#v=onepage&q&f=false

MIT. (2011). *The Density Atlas*. Retrieved April 2020 from http://densityatlas.org/

North Carolina Climate Office. (n.d.). *Albedo.* Retrieved May 2020 from https://climate.ncsu.edu/edu/Albedo

Ozyavuz, M. (2013). *Advances in landscape architecture* [PDF]. https://doi.org/10.5772/51738

Pojani, D., & Stead, D. (2016). *The Urban Transport Crisis in Emerging Economies* (The Urban Book Series) (1st ed. 2017 ed.). Cham, Switzerland: Springer Nature. pp. 11-30

Pötz, H., & Bleuzé, P. (2012). *Groenblauwe netwerken voor duurzame en dynamische steden.* Delft, Netherlands: atelierGROENBLAUW.

PPS. (2017). W*hat is Shared Space?* Retrieved March 2020, from https://www.pps.org/article/what-is-shared-space

Pritchett, R. (2011). Land titling as women's empowerment: Critical observations from Recife Brazil. Retrieved February 2020 from https://core.ac.uk/download/pdf/4837523.pdf

Roggema, R. (2016). *Research by Design: Proposition for a Methodological Approach.* Urban Science, 1(1), 2. https://doi.org/10.3390/urbansci1010002

Sim, D. (2019). *Soft City*. Amsterdam, Netherlands: Amsterdam University Press.

Skinner, R., French, M., Acioly jr., C., & Reid, J. (2015). *A Practical Guide to Designing, Planning, and Executing Citywide Slum Upgrading Programmes.* Retrieved December 2019 from https://unhabitat.org/a-practical-guide-to-designing-planning-and-executing-citywide-slum-upgrading-programmes

Spijker, J. (2019, November 21). *Nature based solutions.* Retrieved April 2020 from https://www.groenkennisnet.nl/nl/groenkennisnet/dossier/dossier-nature-based-solutions.html

Staddon, C., Ward, S., De Vito, L., Zuniga-Teran, A., Gerlak, A., Schoeman, Y., … Booth, G. (2018). Contributions of green infrastructure to enhancing urban resilience. Environment Systems and Decisions, 38(3), 330–338. https://doi.org/10.1007/s10669-018-9702-9

Standaert, B. (2018). *Waterbench*. Retrieved April 2020 from https://ebema.be/nl-BE/waterbench

Swinney, J. (2016, August 25). *Designing Streets: A Policy Statement.* Retrieved March 2020, from

https://www.gov.scot/publications/designing-streets-policy-statement-scotland/

Tosca, K. (2019, April 3). *What is urban furniture?* Retrieved June 2020, from https://www.neko-europe.com/what-is-urban-furniture/

Vanhoutte, L., & De Baere, M. (2019). *ISTT Brazil, special zones for social interest, district of Chié, Recife Reviving the Community of Chié*. Antwerp, Belgium: Author.

Vertical Greenery - Moving Upwards. (n.d.). Retrieved April 2020 from https://www.nparks.gov.sg/skyrisegreenery/explore/vertical-greenery

Veysseyre, S. (2017, September 14). *Case Study: The Unspoken Rules of Favela Construction.* Retrieved February 2020 from https://www.archdaily.com/531253/case-study-the-unspoken-rules-of-favela-construction

Vieira de Abreu-Harbich, L., Chebel Labaki, L., & Matzarakis, A. (2015, June 1). *Effect of tree planting design and tree species on human thermal comfort in the tropics.* ScienceDirect, 138, 99–109.

Vinnitskaya, I. (2017, September 14). *Regeneration of the Favela de Rocinha Slum*. Retrieved January 2020 from https://www.archdaily.com/146314/regeneration-of-the-favela-de-rocinha-slum-jan-kudlicka

Wallenfeldt, J. (2019, 22 augustus). Favela | Definition, History, & Facts. Geraadpleegd op februari 2020, van https://www.britannica.com/topic/favela

Wikipedia contributors. (2020, April 11). *Urban canyon - Wikipedia.* Retrieved March 2020 from https://en.wikipedia.org/wiki/Urban_canyon

Ilha do Joaneiro

MICHELLE VENNEKENS

living in colour

Universiteit Antwerpen

TABLE OF CONTENTS | ÍNDICE

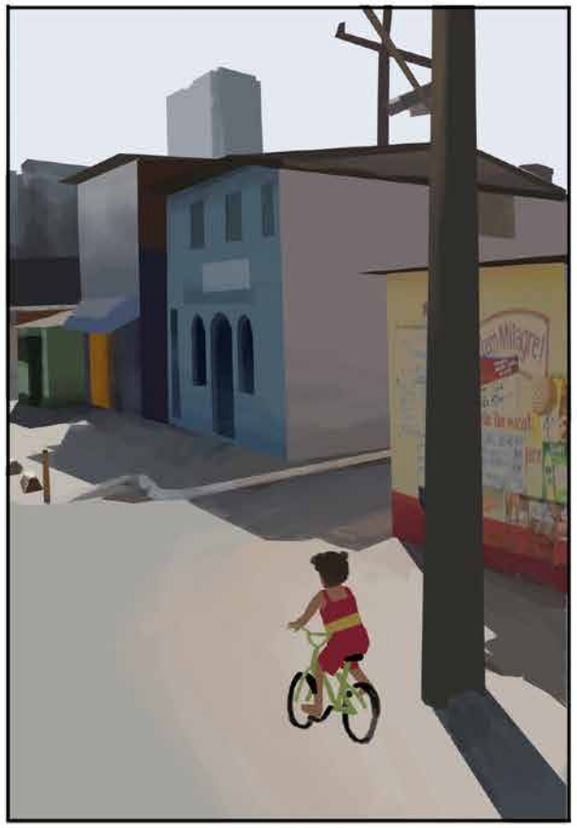
Written and created by:
Vennekens Michelle
Comic book illustrations by:
Veerle Biesbrouck
Translations by:
Silvia Durant & Alice Abreu

Design Studio ISTT
International Studies - Territories in Transition
Faculty of Design Sciences - Architecture
University of Antwerp
Supervisor: De Walsche Johan, Goethals Marleen

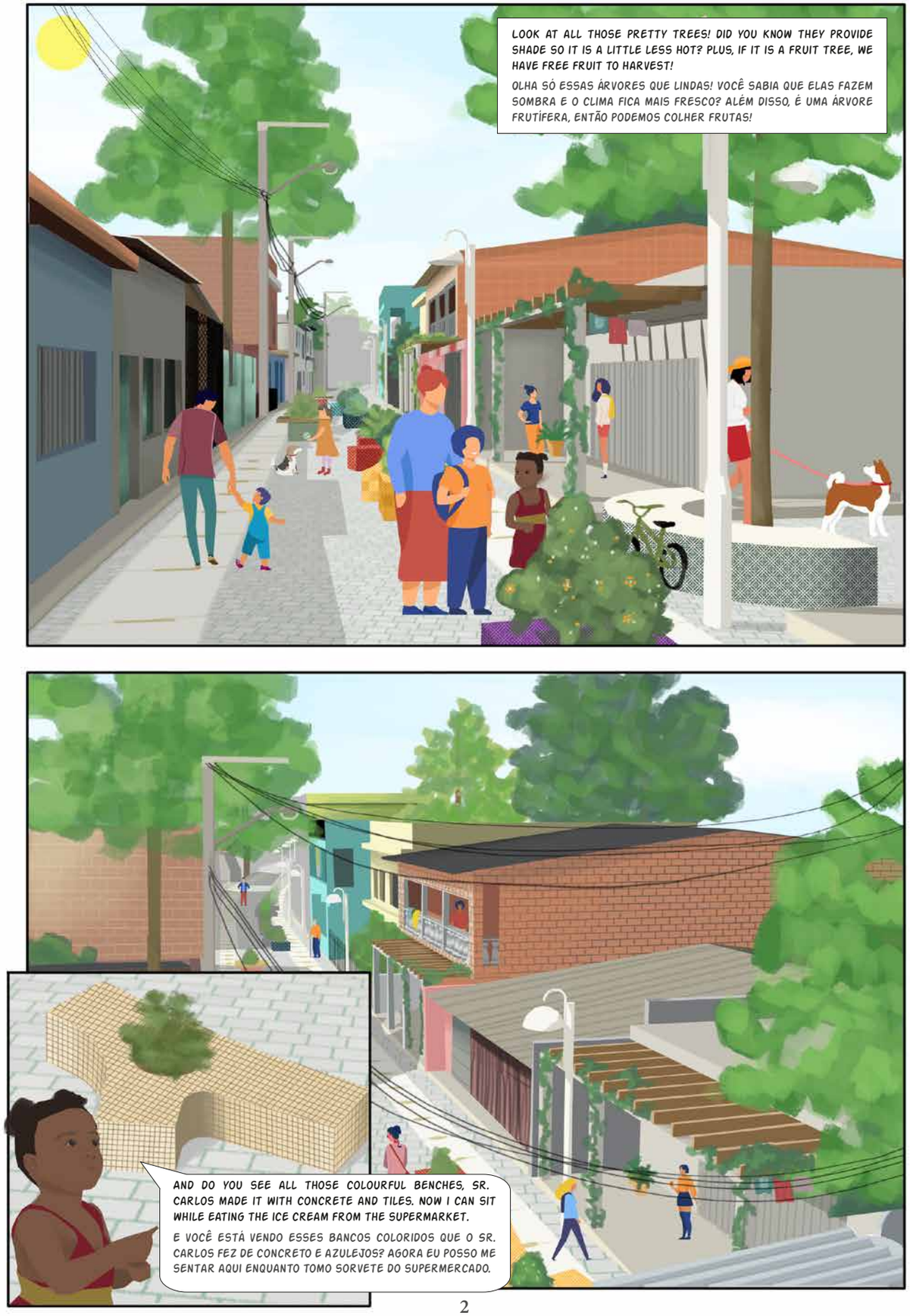
Universiteit Antwerpen

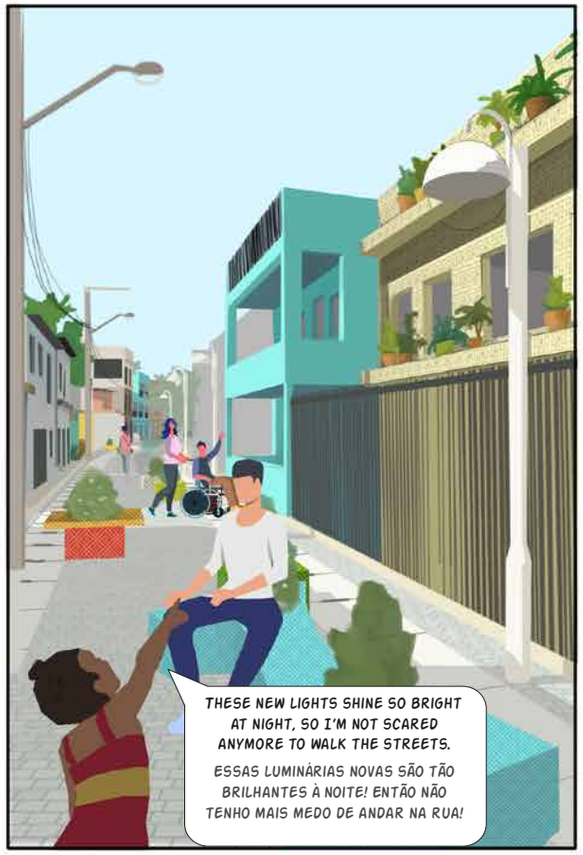
This booklet is part of the thesis: "Ilha do Joaneiro, from living in the grey to living in colour". Vennekens, M. (2020). *Ilha do Joaneiro, from living in the grey to living in colour*

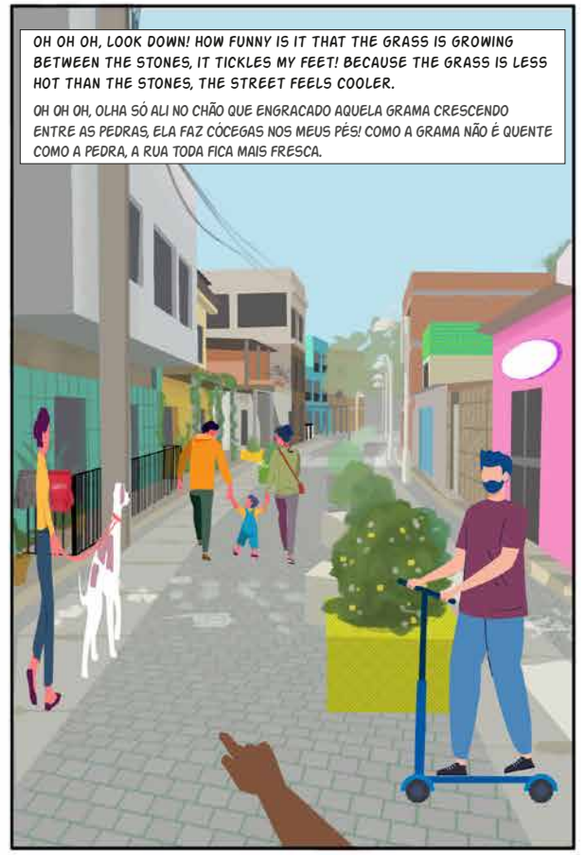

HI, MY NAME IS ISABELA AND I LIVE IN ILHA DO JOANEIRO, A COMMUNITY AT THE PONTE DO MADURO, BETWEEN OLINDA AND THE CITY-CENTER OF RECIFE. I WANT TO SHOW YOU MY HOME, COME ON, FOLLOW ME!
OI, MEU NOME É ISABELE E EU MORO NA ILHA DO JOANEIRO, A COMUNIDADE NA PONTE DO MADURO, ENTRE OLINDA E O CENTRO DE RECIFE. EU VOU TE MOSTRAR MINHA CASA! VEM COMIGO!




ALUGA-SE


LOOK AT ALL THOSE PRETTY TREES! DID YOU KNOW THEY PROVIDE SHADE SO IT IS A LITTLE LESS HOT? PLUS, IF IT IS A FRUIT TREE, WE HAVE FREE FRUIT TO HARVEST!
OLHA SÓ ESSAS ÁRVORES QUE LINDAS! VOCÊ SABIA QUE ELAS FAZEM SOMBRA E O CLIMA FICA MAIS FRESCO? ALÉM DISSO, É UMA ÁRVORE FRUTÍFERA, ENTÃO PODEMOS COLHER FRUTAS!
AND DO YOU SEE ALL THOSE COLOURFUL BENCHES, SR. CARLOS MADE IT WITH CONCRETE AND TILES. NOW I CAN SIT WHILE EATING THE ICE CREAM FROM THE SUPERMARKET.
E VOCÊ ESTÁ VENDO ESSES BANCOS COLORIDOS QUE O SR. CARLOS FEZ DE CONCRETO E AZULEJOS? AGORA EU POSSO ME SENTAR AQUI ENQUANTO TOMO SORVETE DO SUPERMERCADO.


THESE NEW LIGHTS SHINE SO BRIGHT AT NIGHT, SO I'M NOT SCARED ANYMORE TO WALK THE STREETS.
ESSAS LUMINÁRIAS NOVAS SÃO TÃO BRILHANTES À NOITE! ENTÃO NÃO TENHO MAIS MEDO DE ANDAR NA RUA!


OH OH OH, LOOK DOWN! HOW FUNNY IS IT THAT THE GRASS IS GROWING BETWEEN THE STONES, IT TICKLES MY FEET! BECAUSE THE GRASS IS LESS HOT THAN THE STONES, THE STREET FEELS COOLER.
OH OH OH, OLHA SÓ ALI NO CHÃO QUE ENGRACADO AQUELA GRAMA CRESCENDO ENTRE AS PEDRAS, ELA FAZ CÓCEGAS NOS MEUS PÉS! COMO A GRAMA NÃO É QUENTE COMO A PEDRA, A RUA TODA FICA MAIS FRESCA.


WAAAUW, PRETTY FLOWERS GROWING ALL THE WAY UP, UP, UP!!
UAU, LINDAS ESSAS FLORES CRESCENDO, CRESCENDO!!

LOOK AT THE MARKET! WHEN THE SUN SETS, PEOPLE OPEN UP THEIR LITTLE STALLS AND SELL FOOD, CLOTHES AND LITTLE TRINKETS AT THE NEW PLAZA. IT IS ALWAYS REALLY COZY AND FUN WITH THE MUSIC AND FAIRY LIGHTS!

VOCÊ VIU ESSE ESPACO? QUANDO O SOL SE PÕE, AS PESSOAS ABREM SUAS BARRACAS E VENDEM COMIDA, ROUPAS, ARTESANATO NA NOVA PRACA. É SEMPRE ACONCHEGANTE E DIVERTIDO COM MÚSICA E AS LUZES DA FEIRINHA!

LET'S GO TO MY HOUSE!

VAMOS PARA A MINHA CASA!

THIS IS WHERE I LIVE AND UP THERE, THAT'S MY BEDROOM. EVERY MORNING WHEN I WAKE U, I CAN HEAR THE THE LITTLE BIRDS SING IN OUR NEW GARDEN.

AQUI É ONDE EU MORO E ALI EM CIMA É O MEU QUARTO. DE MANHÃ QUANDO EU ACORDO EU OU O OS PASSARINHOS CANTANDO NO NOSSO NOVO JARDIM!

HEY MARCONE! CAN YOU TELL A BIT MORE ABOUT THE NEW GARDEN?

OI MARCONE! VOCÊ PODE FALAR MAIS SOBRE O NOVO JARDIM?

OF COURSE! SO THERE ARE THREE STEPS. FIRST WE BUILD A NEW LEVEL ON TOP, BUT WE LEAVE A PART OF THE ROOF FREE. THEN ONCE THE FAMILY MOVES OUT AND LIVE IN THEIR NEW HOME, WE DEMOLISH THE OLD PART. AND THEN THE OPEN SPACE THAT WAS CREATED IS TURNED INTO A BEAUTIFUL LUSH GARDEN WITH LOTS OF PLANTS AND FLOWERS.

CLARO! FORAM 3 ETAPAS. PRIMEIRO NÓS CONSTRUÍMOS UM OUTRO NÍVEL, MAS DEIXAMOS LIVRE UMA PARTE DO TELHADO. ENTÃO QUANDO A FAMÍLIA SE MUDA E VAI PARA SUA CASA NOVA, NÓS DEMOLIMOS A PARTE ANTIGA. ENTÃO A PARTE QUE FICOU ABERTA É TRANSFORMADA EM UM BELO JARDIM COM PLANTAS E FLORES!

THAT'S IT, THANK YOU! TCHAU!!!

É ISSO AÍ! MUITO OBRIGADA! TCHAU

ENG

TOOLBOX FOR TRANSFORMATIONS

To help the residents and the community leader, a toolbox is set up to use when it gets decided to make changes to the public space or houses in the community. The toolbox contains two sets of recommendations. A first set of recommendations consists of systemic mechanisms. These recommendations are intangible assets. This means that the asset lacks a physical substance. These recommendations are more acts that will be of an influence on the second set of recommendations consisting out of the physical assets or elements.

Therefore, the systemic mechanisms are to be consulted before continuing with the physical elements. So as the community leader has the function to act as a mediator when residents want to expand or renovate, he also has the final say in urban interventions of the public space. The recommendations of systemic mechanisms for building renovations follow the order given in this document, while the recommendations on systemic mechanisms for urban transformation are regardless of an order.

The second set of recommendations, the physical elements, are elements used during the transformation. This thesis wants to be an inspiration on how the physical elements are to be used in a more proper way for the community to benefit more from the transformations. There is no order to these recommendations.

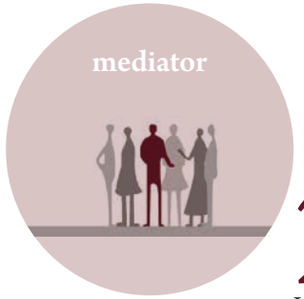
This toolbox strives for a greener, more vibrant community where people have better social interactions and become part of the shared space where comfort is a priority, as well is safety. All interventions are people oriented, personalizing the favela. All personal interventions contribute to the social life and interaction between the residents. Thus involving the people in the street life, where they become part of the street and community.

ENG

SYSTEMIC MECHANISMS FOR HOUSING TRANSFORMATIONS

1.

When you decide to expand or renovate, talk to the community leader about the possibilities, rules and regulations.



2.

Let the community leader play the part of mediator during negotiations or before | antes transformations.

3.

Invest in comfort. Provide approximately 23m² of living space per person. Thus encourage the development of more dwellings.

4.

Restrict the building height to no more than three levels, roof terraces excluded, depending on the density level of the area.

5.

Make use of the density diagram for systematic development in the different street zones.

6.

Work with different house typologies of transformations. Look at the best options per case, separately. Allow for not restricting future transformations of possible neighbours.

ENG

9.

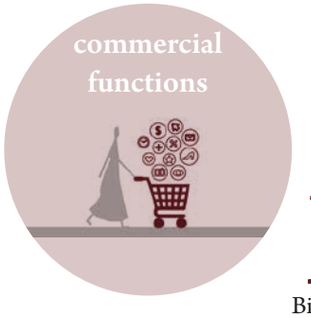
When the road needs an upgrade, choose cobblestones with a grass grout instead of concrete.

10.

When the sewage pipes needs replacement, choose to remove the sidewalks and convert the street into a shared street focused on pedestrians.

8.

Rent out or commission empty ground floor spaces to be used for a commercial purposes or services, and improve the economy in the community.



13.

Bigger open spaces should be used as a kind of plaza where multiple events can take place;
for example: a market, a small concert, community barbecue, etcetera...

12.

Limit motorists in the community. Regulate delivery hours.

7.

Negotiate with neighbours about selling or buying air rights to improve one's house.

SYSTEMIC MECHANISMS FOR URBAN TRANSFORMATIONS

11.

Reduce parking spaces in the street, and encourage parking at the entrance of the community at the Avenida Governador Agamenon Magalhaes. Create a safer street focused on pedestrians.

ENG

PHYSICAL ELEMENTS FOR HOUSING TRANSFORMATIONS

1.

Boost social interaction in the shared street by making small moments through the use of overhangs or pergolas.

2.

Create more shade closer to houses using overhangs or pergolas.

3.

Encourage the use of covered entrances that could also serve as balconies at the street side, to create more eyes on the street and increase the feeling of safety and social interaction.

4.

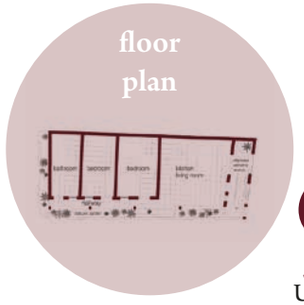
Add a roof terraces on the top floors to dry clothes or organize gatherings on the weekends.

5.

Personalize and insulate the house better with the use of vertical gardens consisting of planters and climbing plants that require little maintenance.

6.

Plant several gardens throughout the community. A better wind flow is created and the heat island effect is lessened. Improve the health of the community through greenery.

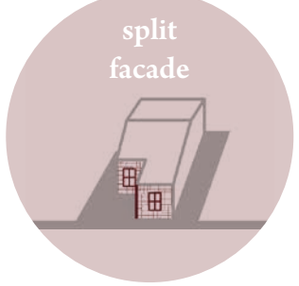


7.

Motivate the implementation of balcony gardens to increase natural ventilation. Use the floor plan as guidance for new transformations.

8.

Create small outdoor spaces by making use of a split facade to enhance social interaction and safety, e.g. more eyes on the street.

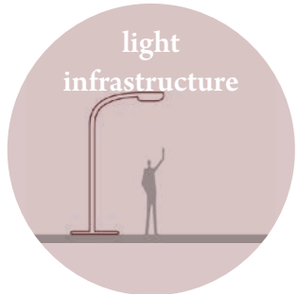


9.

Use smaller interventions when less resources are available based on the house typology of transformations.

10.

Invest in light infrastructure on a human scale to increase safety and to give character to the street 'as a place'.



PHYSICAL ELEMENTS FOR URBAN TRANSFORMATIONS

11.

Implement street furniture to create comfort and reduce traffic. Create a mold for a twig bench. Manufacture the twig bench in concrete. Personalize the bench with tiling in bright colours.

12.

Plant street trees at the location where they can fully develop to define the space and create shade.

ENG

POR (BR)

CAIXA DE FERRAMENTAS DE TRANSFORMAÇÃO

Para ajudar os moradores e o líder da comunidade, a caixa de ferramentas foi configurada para ser utilizada quando for decidido fazer alterações no espaço público ou nas casas da comunidade. A caixa de ferramentas contém dois conjuntos de recomendações. O primeiro conjunto consiste em mecanismos sistêmicos. Essas recomendações são objetos intangíveis, isto é, o objeto em questão não possui uma substância física. Essas recomendações são atos que influenciarão o segundo conjunto de recomendações constituído pelos ativos ou elementos físicos.

Portanto, os mecanismos sistêmicos devem ser consultados antes de continuar com os elementos físicos. O líder da comunidade tem a função de atuar como mediador quando os moradores desejam expandir ou reformar suas casas e também tem a palavra final em intervenções urbanas do espaço público. As recomendações de mecanismos sistêmicos para efetuar renovações seguem a ordem dada neste documento, enquanto as recomendações sobre mecanismos sistêmicos de transformação urbana são independentes de uma ordem.

O segundo conjunto de recomendações, são os elementos físicos usados durante a transformação. Esta tese tem a intenção de ser uma inspiração sobre como os elementos físicos podem ser usados de maneira adequada para que a comunidade se beneficie ainda mais das transformações. Não há ordem exata para essas recomendações serem efetuadas.

Esta caixa de ferramentas busca uma comunidade mais verde e vibrante, onde as pessoas possam ter melhores interações sociais e tenham um espaço compartilhado onde o conforto e segurança são prioridades. Todas as intervenções são orientadas para as pessoas, personalizando a favela. Todas as intervenções pessoais contribuem para a vida social e a interação entre os residentes. Assim, envolve as pessoas na vida nas ruas, onde elas se tornam parte da rua e da comunidade.

POR (BR)

MECANISMOS SISTÊMICOS PARA TRANSFORMAÇÕES DE CASAS.

1.

Quando você decidir expandir ou renovar, converse com o líder da comunidade sobre as possibilidades, regras e regulamentos.

2.

Permita que o líder da comunidade faça a mediação durante as negociações ou frente às mudanças.

3.

Invista em conforto. Proporcione aproximadamente 23m² de espaço útil por pessoa. Assim encoraje o desenvolvimento de mais habitações.

4.

Restrinja a altura da construção para no máximo 3 andares sem contar os terraços no telhado, dependendo do nível de densidade da área.

5.

Faça uso do diagrama de densidade para desenvolvimento sistemático nas diferentes zonas de ruas.

6.

Trabalhe com diferentes tipologias construtivas. Considere separadamente a melhor opção em cada caso. Escolha não restringir as possibilidades de futuras reformas a serem feitas por vizinhos.

7.

Negocie com os vizinhos a compra ou venda de direitos de reformar uma casa.

8.

Alugue ou comissione espaços vazios no nível térreo para fins comerciais ou de serviços e melhore a economia na comunidade.

9.

Quando a rua precisar de melhorias, escolha paralelepípedos intercalados com grama em lugar de concreto.

10.

Quando a tubulação de esgoto precisar de substituição, opte por remover as calçadas e converter a rua em um espaço compartilhado, focado nos pedestres.

11.

Reduza vagas na rua e incentive o estacionamento na entrada da comunidade, na Avenida Governador Agamenon Magalhães. Crie uma rua mais segura, focada em pedestres.

12.

Limite motoristas na comunidade. Regulamente horários de serviços de entrega.

13.

Espaços abertos amplos devem ser usados como uma espécie de praça onde vários eventos possam ocorrer; por exemplo, um mercado, feira, um pequeno show, churrasco comunitário, etc.

MECANISMOS SISTÊMICOS PARA TRANSFORMAÇÕES URBANAS

POR (BR)

POR (BR)

ELEMENTOS FÍSICOS PARA TRANSFORM-AÇÕES EM CASAS

1.

Aumente a interação social na rua compartilhada, criando pequenos momentos através do uso de áreas cobertas ou pérgolas.

áreas cobertas

2.

Crie mais sombra nas proximidades das casas usando coberturas ou pérgolas.

pérgolas

terraços

3.

Encoraje o uso de entradas cobertas que possam servir como sacadas no lado da rua, criando mais visão do exterior e melhorando a sensação de segurança e interação social.

entradas cobertas

4.

Adicione terraços nos andares superiores para secar roupas e organizar encontros nos finais de semana.

5.

Personalize e isole melhor a casa com o uso de jardins verticais compostos por floreiras e trepadeiras que requerem pouca manutenção.

jardins verticais

6.

Plante jardins em toda a comunidade. Isso cria um melhor fluxo de vento e o efeito da ilha de calor é reduzido. Melhore a saúde da comunidade através de áreas verdes.

jardins

floor plan

7.

Motive a implantação de jardins nas sacada para aumentar a ventilação natural. Use a planta da construção como orientação para novas transformações.

jardins nas sacada

fachadas divididas

8.

Crie pequenos espaços ao ar livre utilizando-se de fachadas divididas, para melhorar a interação social e a segurança por exemplo com mais visão da rua.

ELEMENTOS FÍSICOS PARA TRANSFORM-AÇÕES URBANAS

9.

Faça intervenções menores quando menos recursos estiverem disponíveis, com base na tipologia de transformações.

árvores de rua

10.

Invista em infraestrutura leve e ao alcance humano para aumentar a segurança e dar personalidade às ruas ‘como um espaço’.

11.

Implemente mobiliário urbano para criar conforto e reduzir o tráfego. Crie um molde para um banco “twig”. Fabrique-o em concreto. Personalize com azulejos em cores brilhantes.

mobiliário urbano

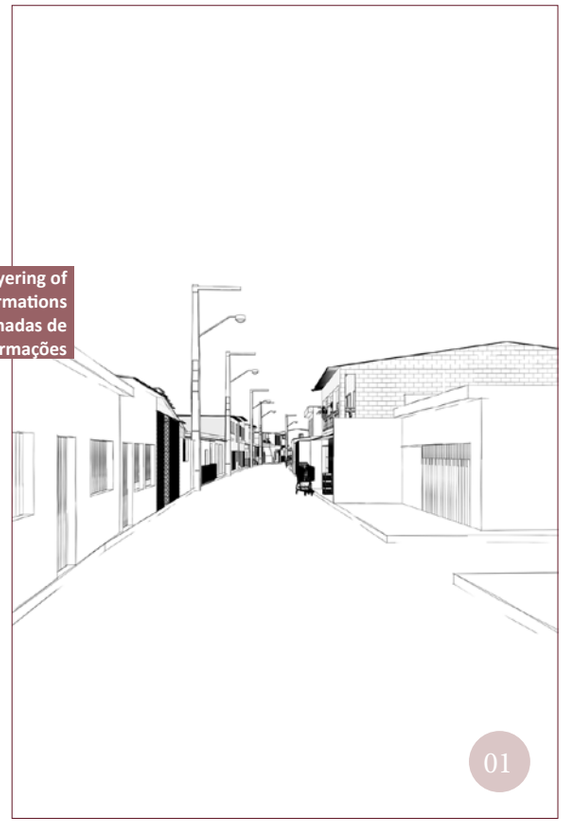
12.

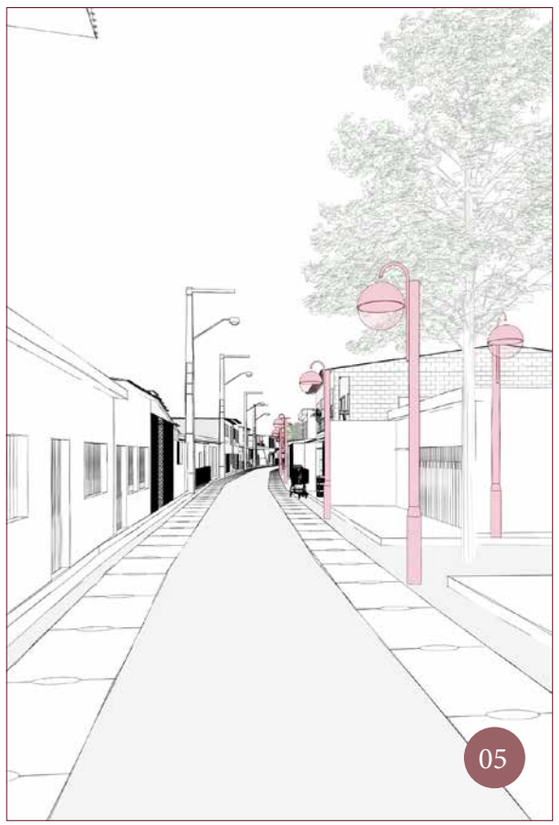
Plante árvores de rua em local onde elas possam desenvolver-se completamente, definindo o espaço e criando sombra.

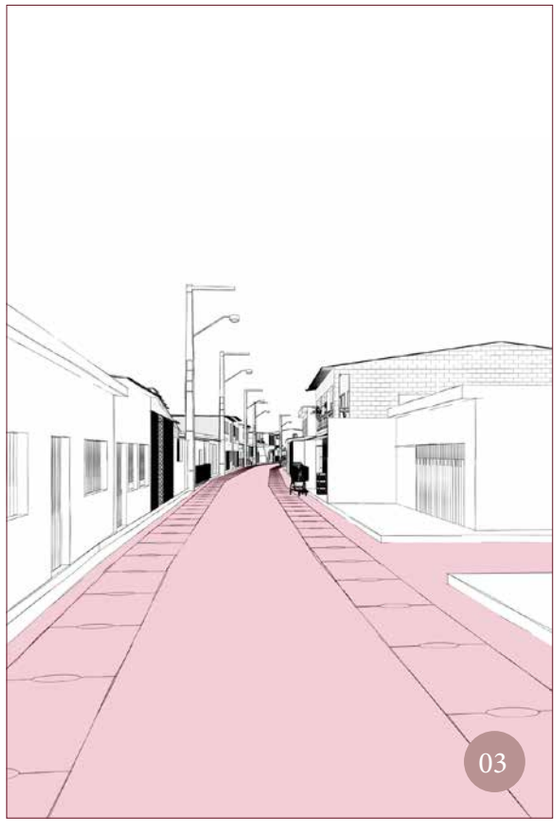
infraestrutura leve

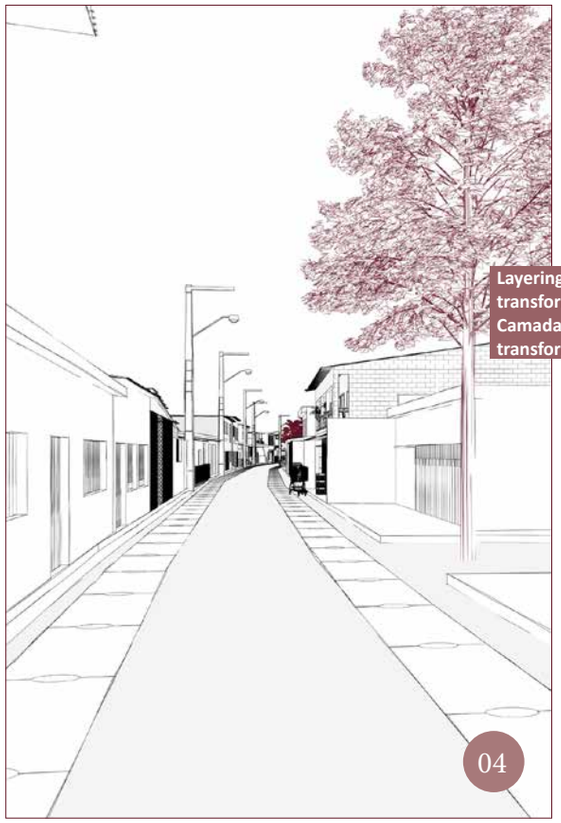
POR (BR)

Layering of transformations
Camadas de transformações

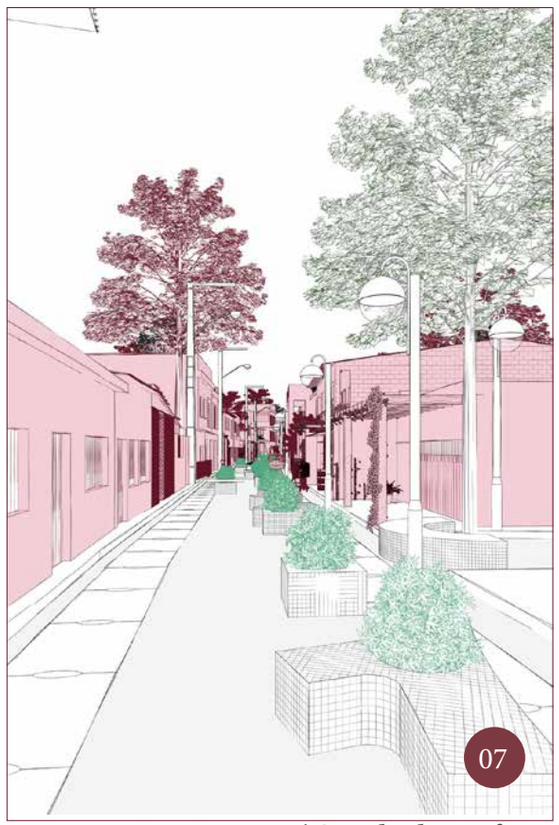




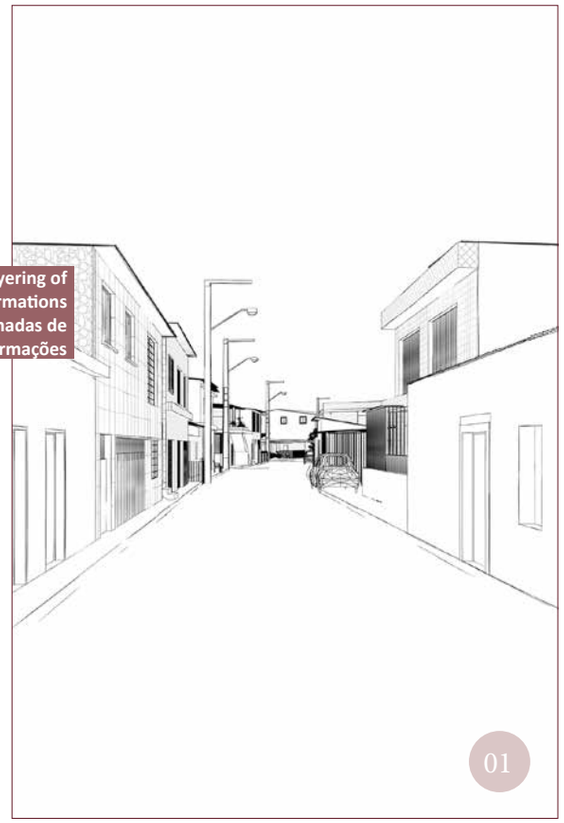


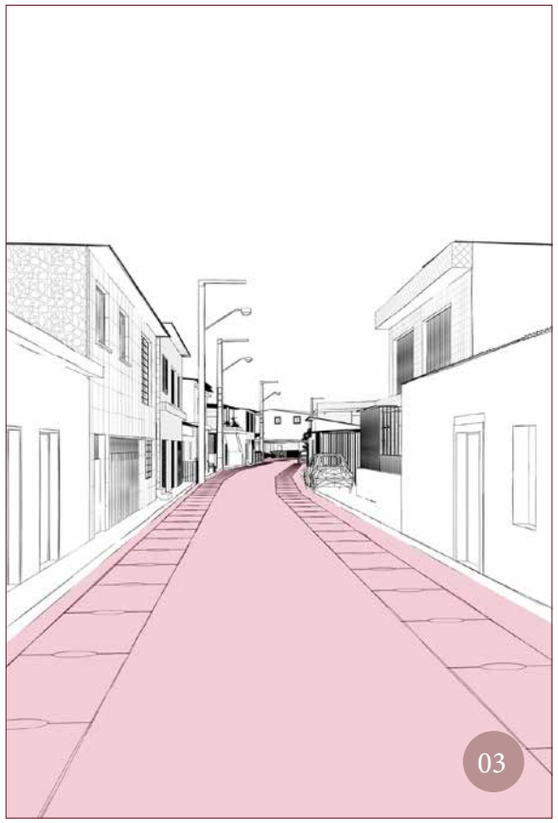


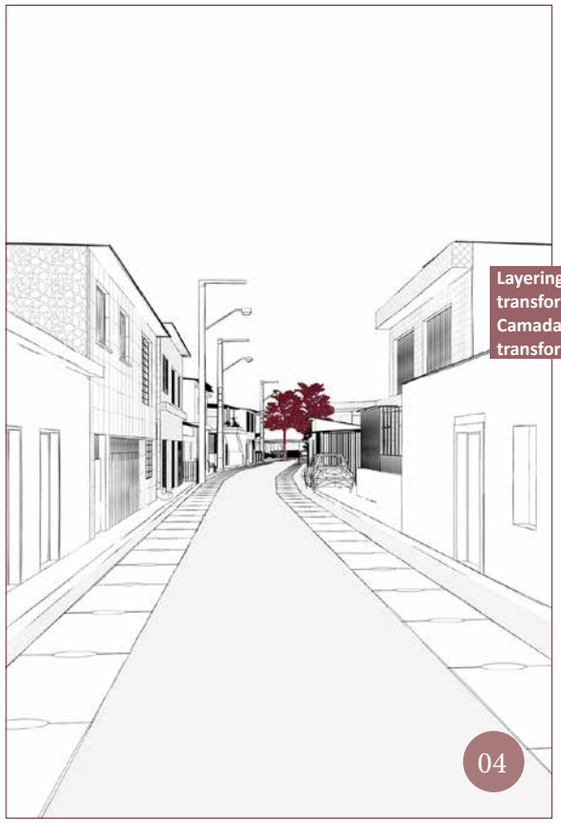
Layering of transformations
Camadas de transformações



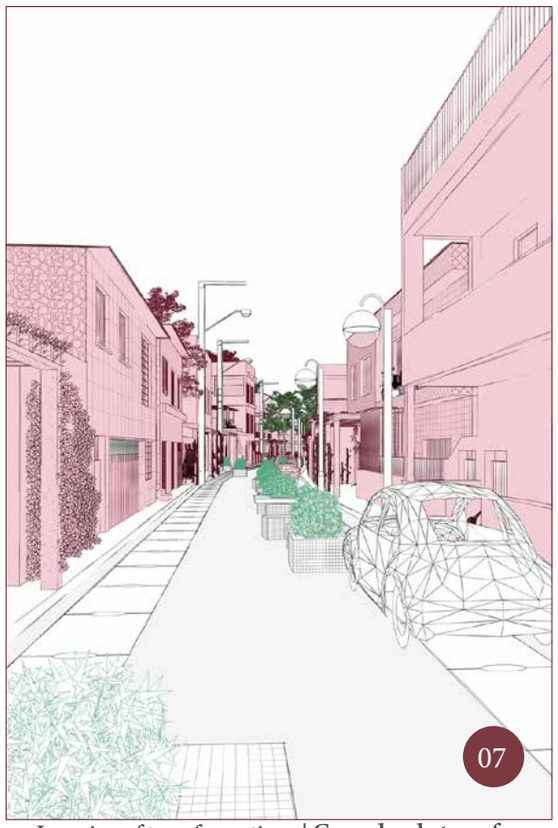
Layering of transformations
Camadas de transformações



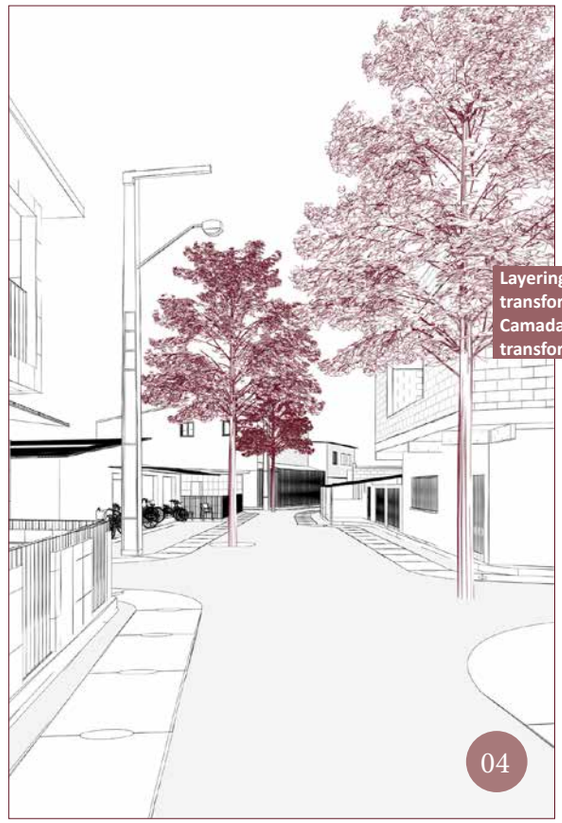




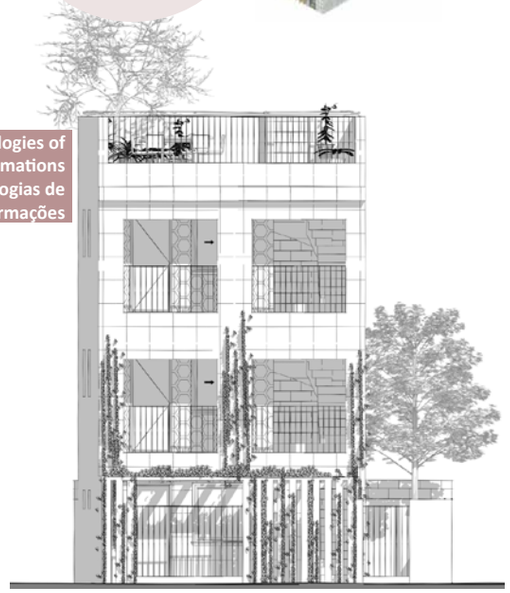
Layering of transformations
Camadas de transformações



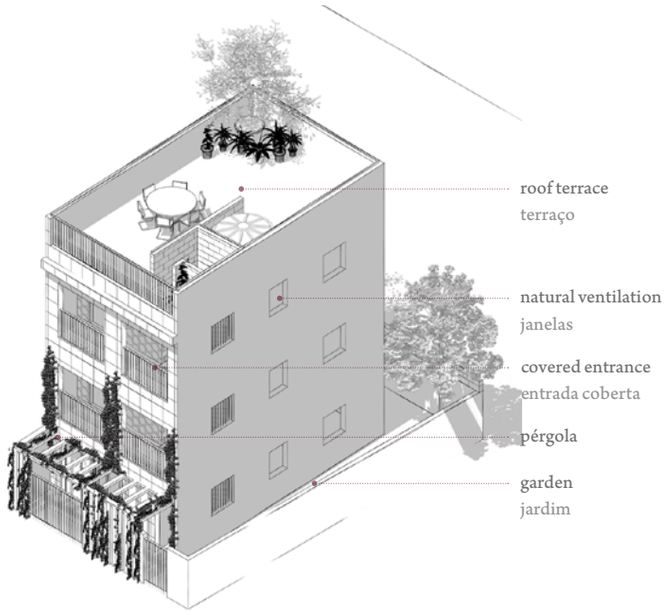
Layering of transformations
Camadas de transformações



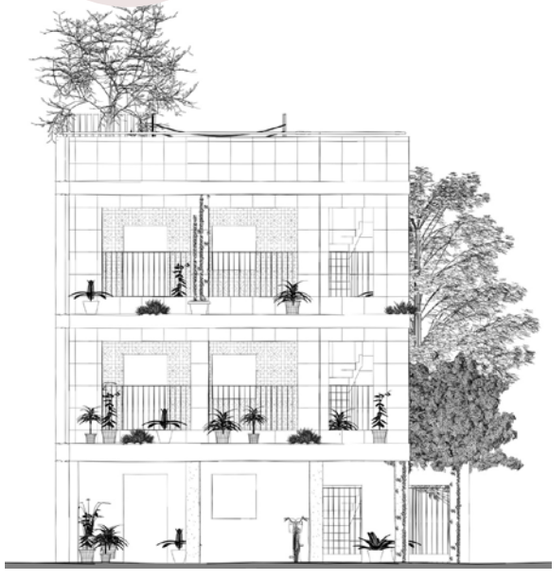
01

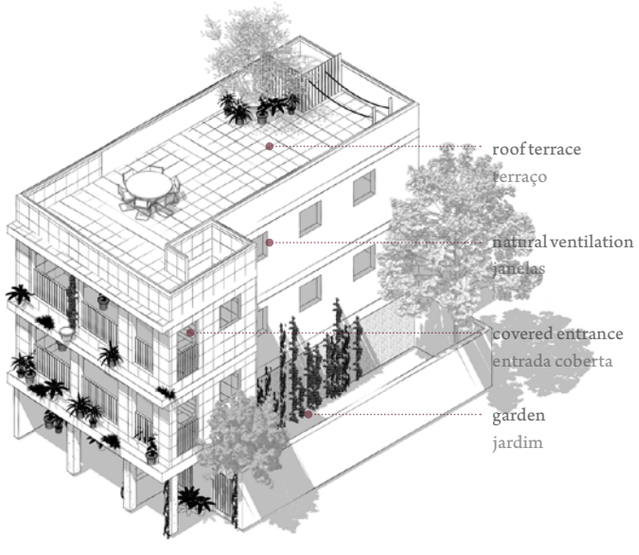


typologies of transformations
tipologias de transformações

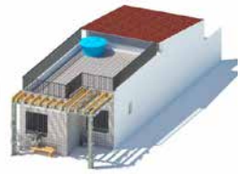


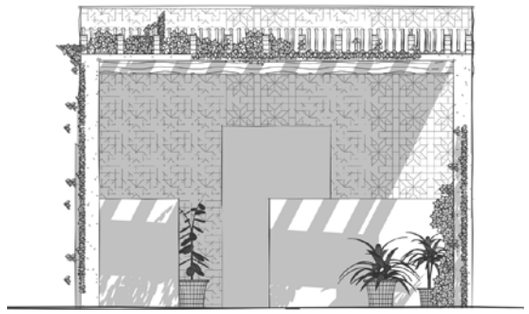
02



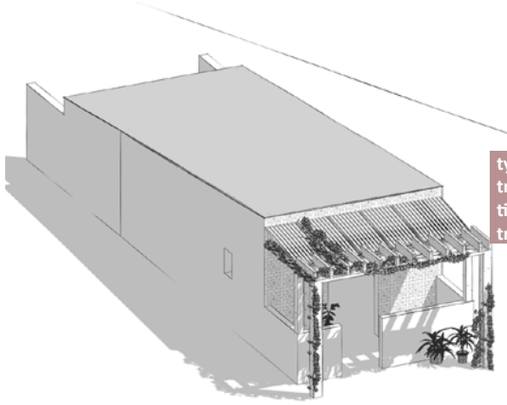


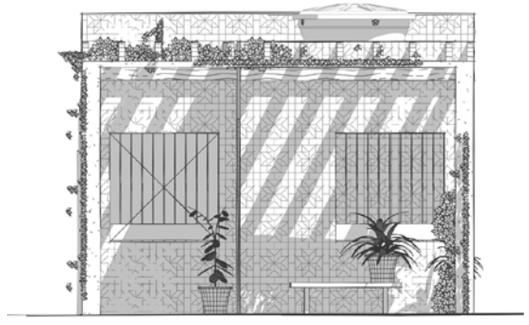
03

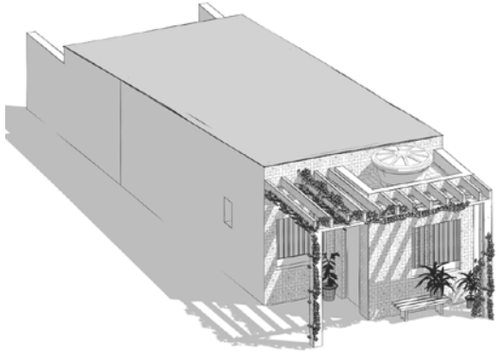


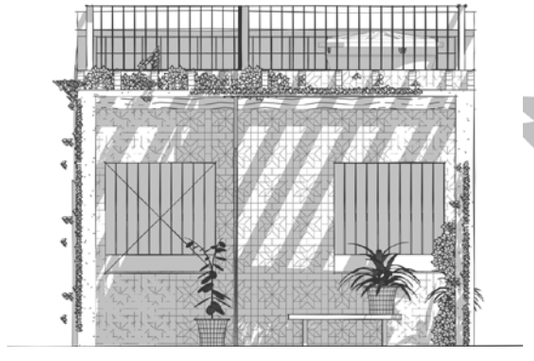


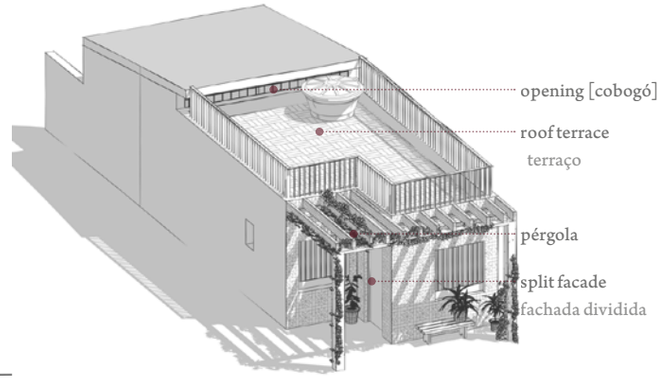
typologies of transformations
tipologias de transformações





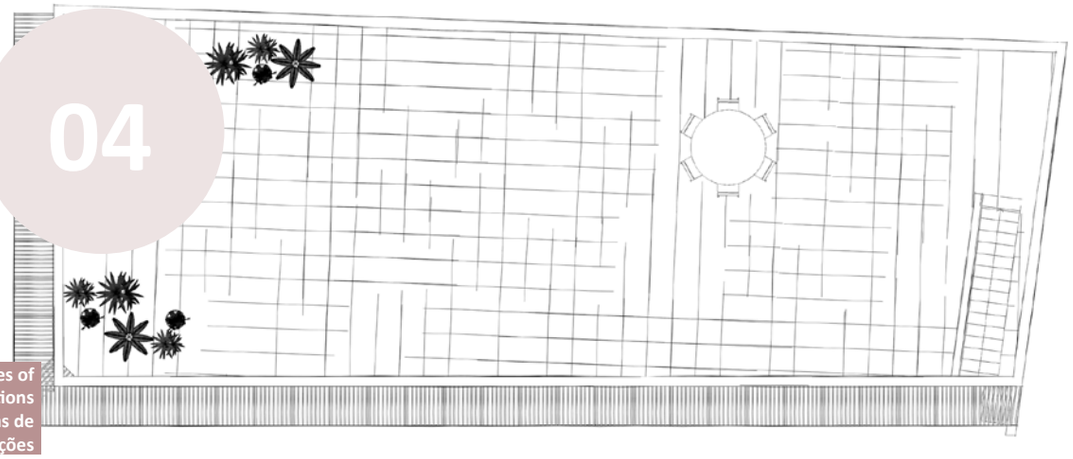




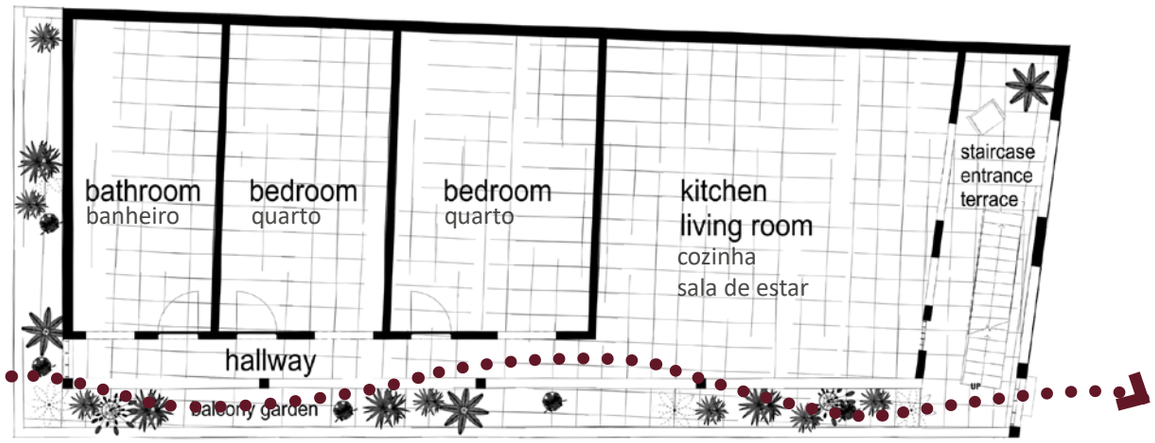


04

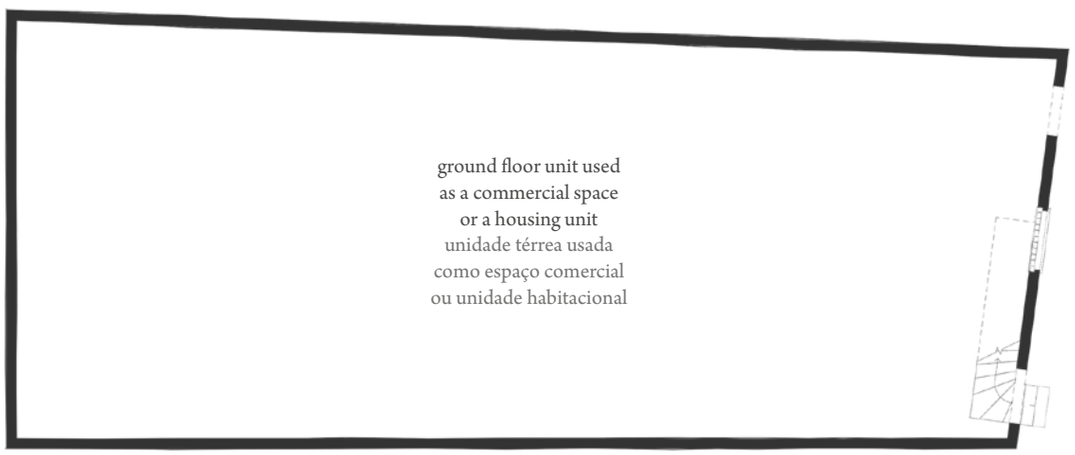
typologies of transformations
tipologias de transformações



+2

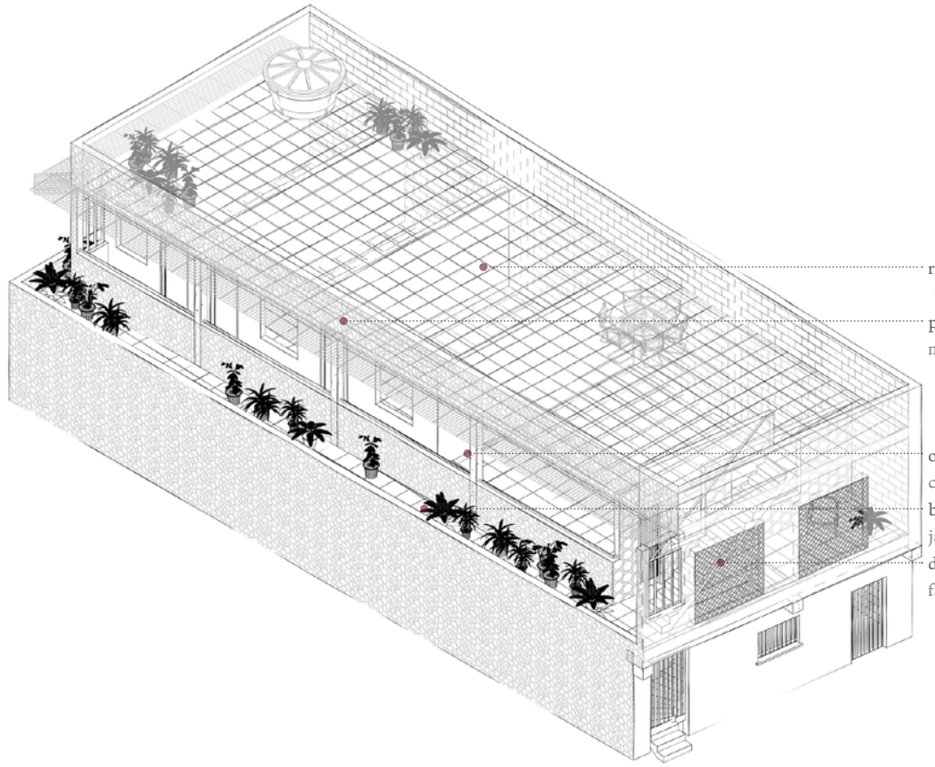


+1

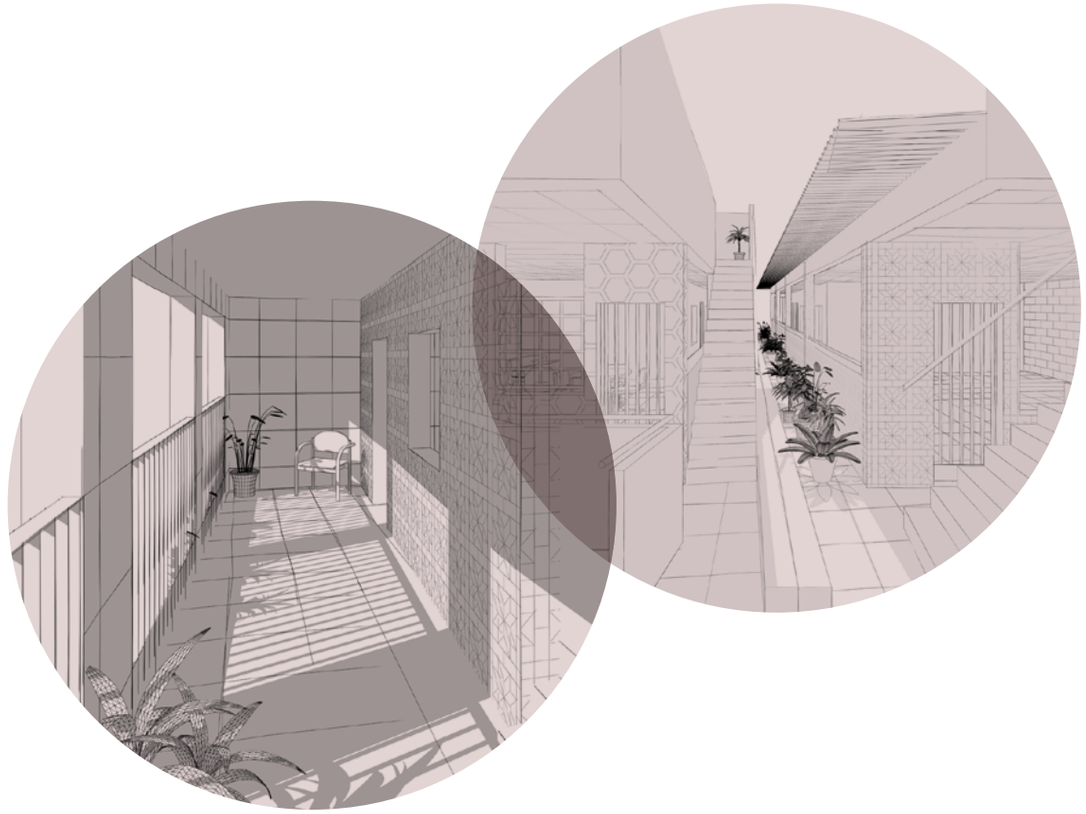


ground floor unit used
as a commercial space
or a housing unit
unidade térrea usada
como espaço comercial
ou unidade habitacional

+0



typologies of transformations
tipologias de transformações




before | antes

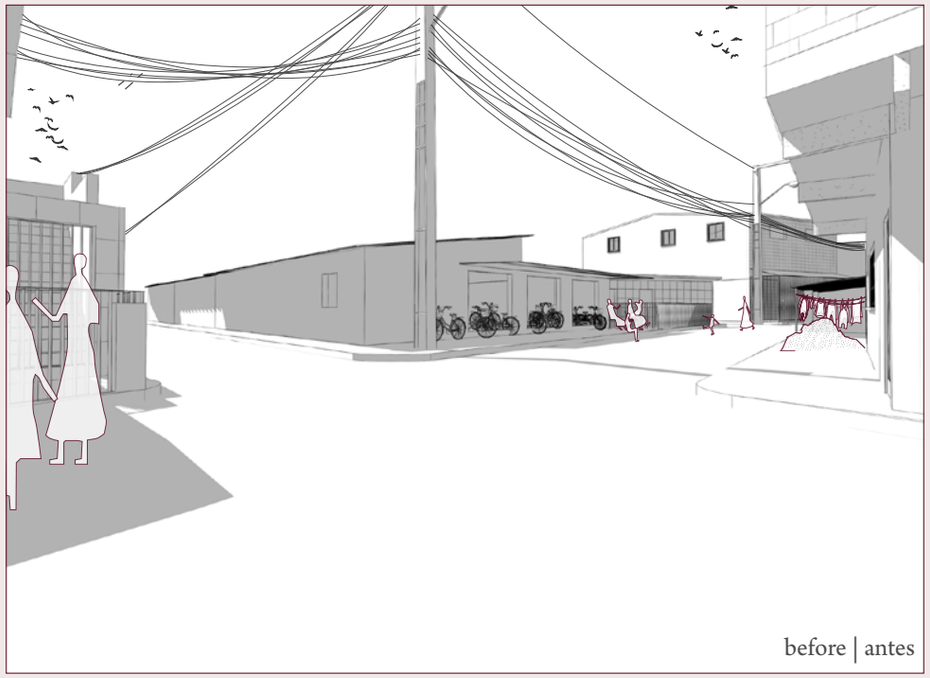

after | depois


before | antes

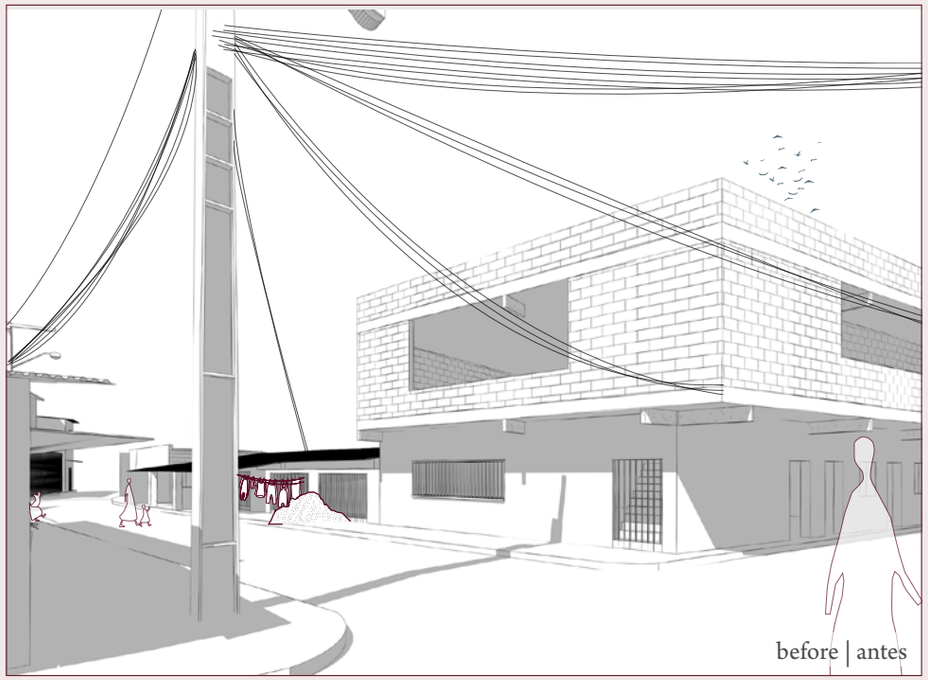

after | depois

transformations
before & after
transformações
antes & depois

transformations
before & after
transformações
antes & depois



transformations
before & after
transformações
antes & depois



transformations
before & after
transformações
antes & depois