Pop-up Architecture in Spatial Justice

Lorena Guimaraes

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Pop-up Architecture as an Immediate and Transformative tool
toward the Social and Economic Inclusion
of Delivery Drivers in
São Paulo's Spatial Organization.

BY

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A RESEARCH PROJECT PRESENTED TO THE GRADUATE SCHOOL
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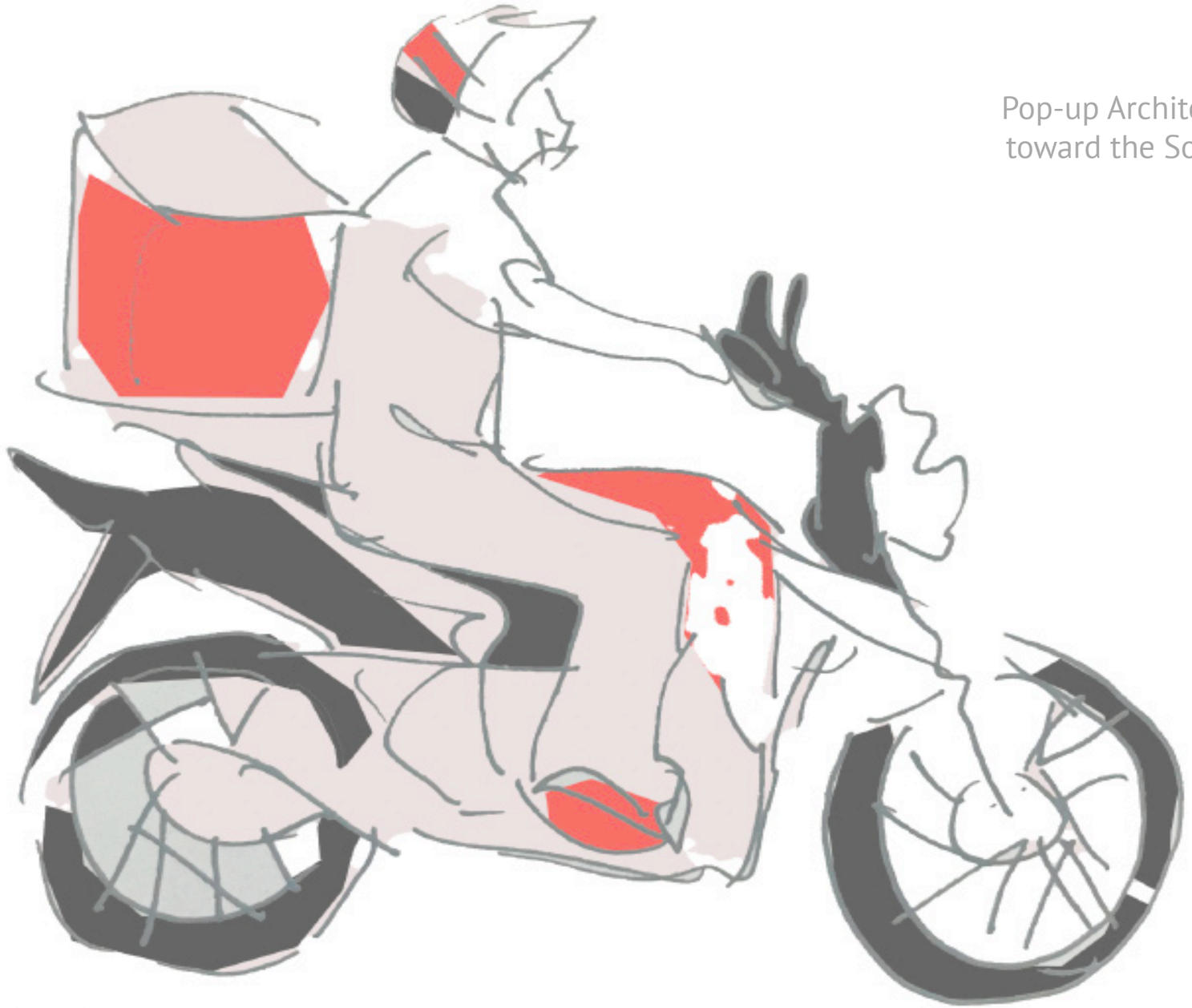

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Pop-up Architecture as an Immediate and Transformative Tool toward the Social and Economic Inclusion of Delivery Drivers in

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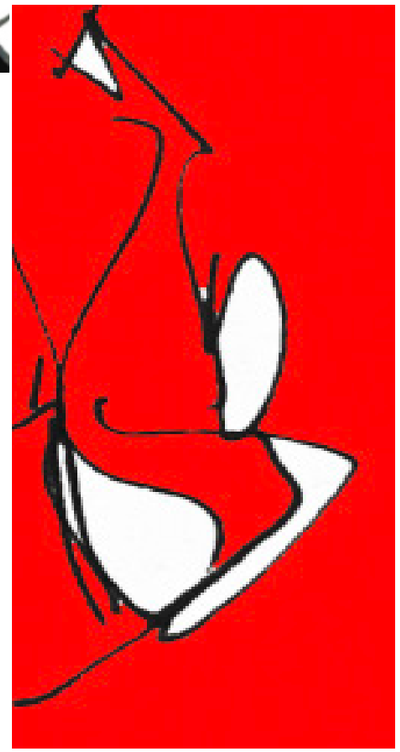

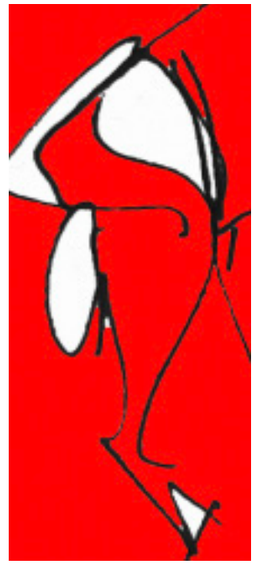

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ACKNOWLEGMENTS

We need each other to get to know ourselves. It is through the exchange of thoughts and emotions that we shape who we are and design our paths.

I want to thank my Committee, Professor Stathis Yeros and Professor Stephen Bender, for believing in my idea and pointing me in the right direction. Their expertise and dedication have been a source of inpiration and motivation.

I want to thank my mother Audizia, for ensuring I had every opportunity in education, and to my siblings, Larissa, Pedro, and Josias for their support and for making me laugh in the most challenging times.

To my father Josias, your life was a blessing, your memory a treasure.

Finally, I thank my husband Nate for his patience and encouragement.

I dedicate this accomplishment to all of you.

ABSTRACT

This research explores pop-up architecture as a tool to improve the working conditions and social inclusion of delivery drivers in São Paulo, Brazil. The social isolation provoked by the COVID-19 pandemic significantly increased the number of delivery drivers, who face many challenges, including traffic congestion, limited parking, public safety, and inadequate rest facilities. The drivers have also encountered stigmatization and prejudice from society, mostly from segments of society. Quantitative and qualitative data were used to identify the delivery driver and to point out facts of inequality and spatial justice in Brazil.

The research also identified that strategically placed rest stops throughout the city can provide drivers with essential amenities to rest, wait for calls, protect from weather, and restrooms. Pop-up architecture was adequate for this problem for being adaptable, rapidly deployed and reconfigured to meet the dynamic urban settings of the city of São Paulo. The modular structure system seemed adequate to meet the mobility, changeability, and transportability of the rest stops. This research highlights the potential of pop-up architecture to enhance the well-being and social inclusion of delivery drivers in São Paulo, suggesting that city planners and society should consider perceiving these workers as a recognized working class entitled to a place in the city.

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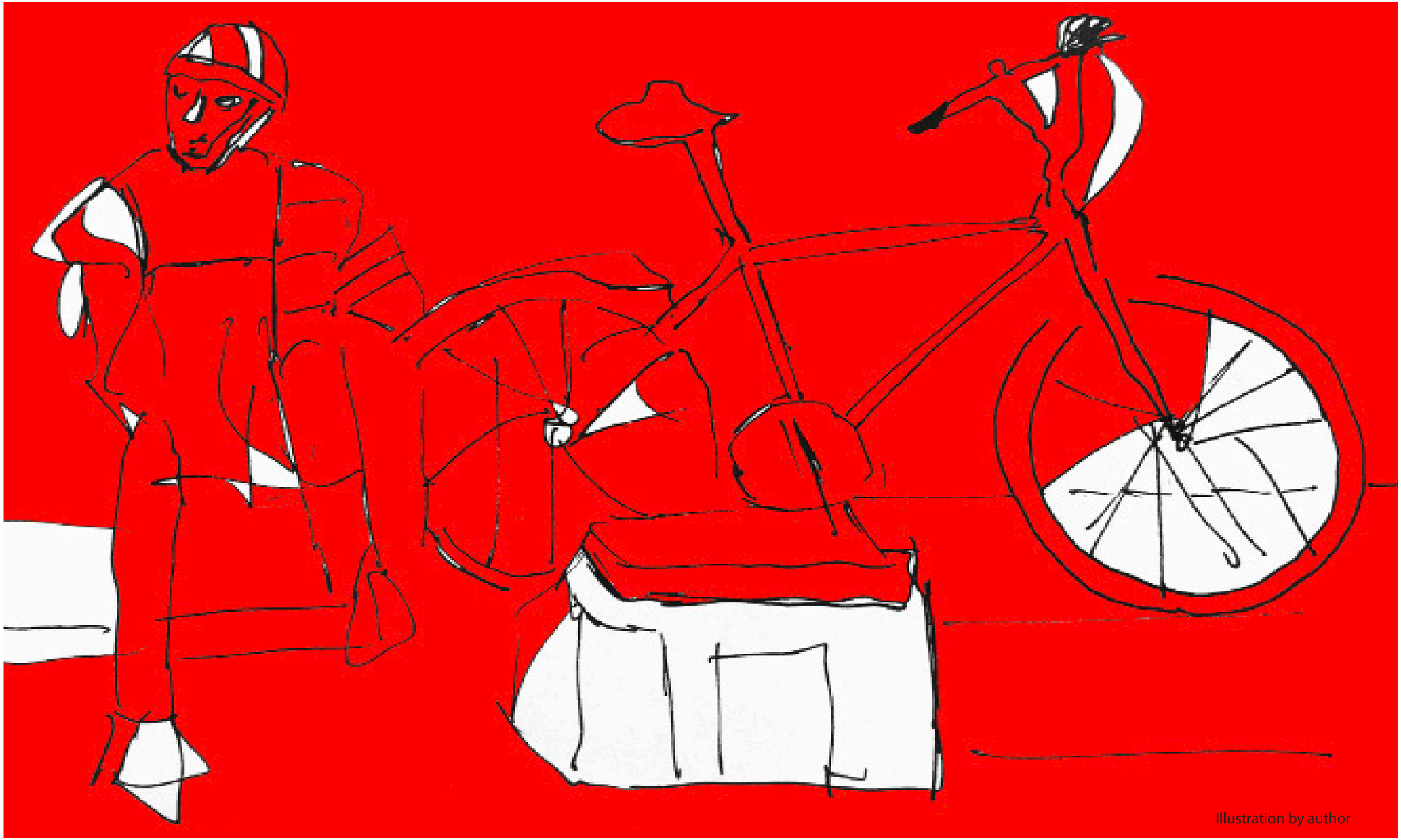

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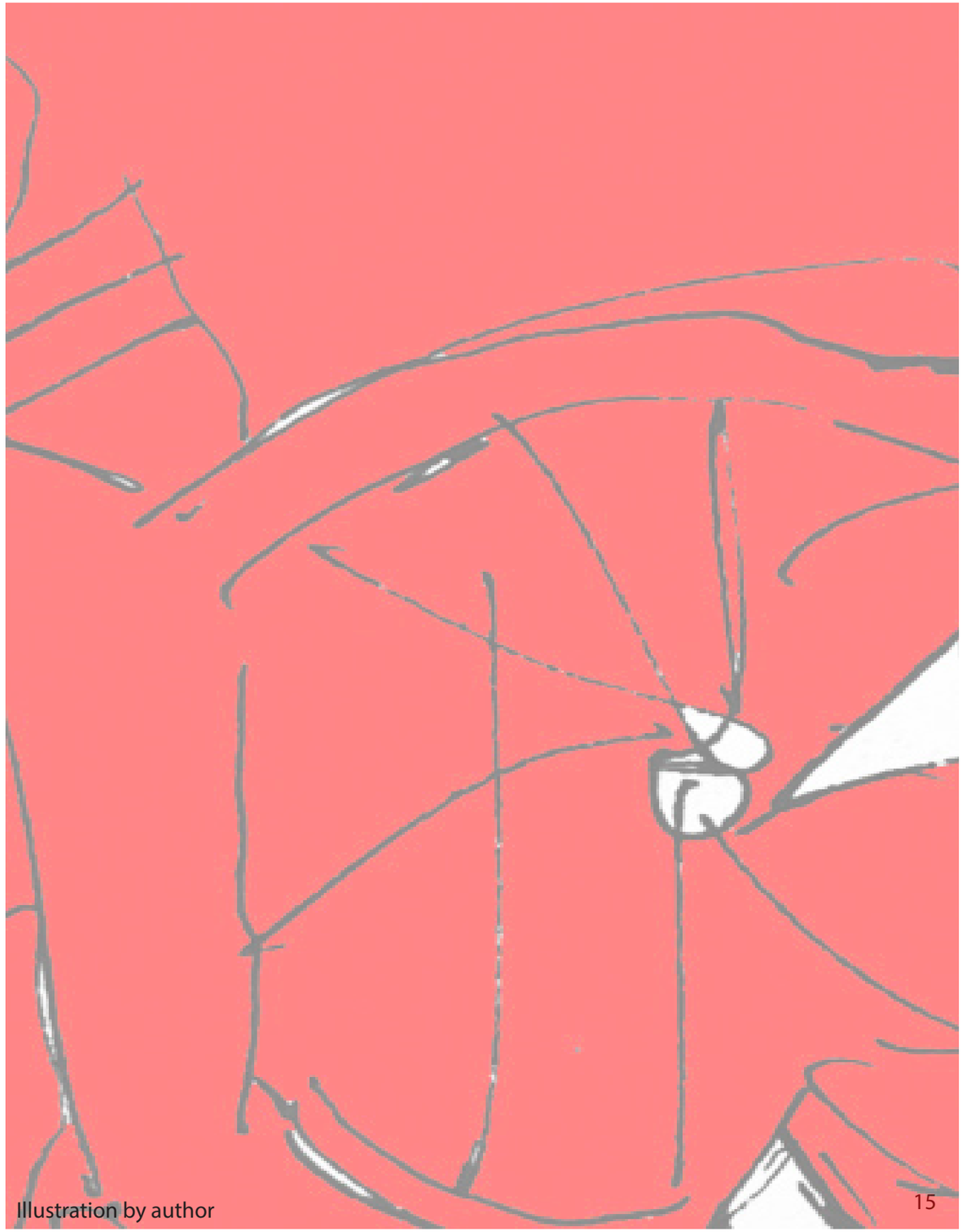
introduction

In many countries, delivery drivers play a crucial role in the economy and daily life, becoming an essential player in the supply chain. The social isolation provoked by the COVID-19 pandemic significantly increased the demand for these professionals and inherent challenges related to their working conditions, safety, and well-being.

Lacking a dedicated place to rest, it is not uncommon to see delivery drivers taking breaks on sidewalks or public squares between deliveries. This habit has triggered adverse and prejudiced reactions from society, primarily within upscale neighborhoods, denying them the right to the space. Although the challenges and stigmatization from society do not stop delivery drivers from working, they contribute to fatigue, stress, overwork, and low-morale.

Pop-up architecture, defined by temporary, flexible, easily transported, and deployed structures, seems adequate to support delivery drivers' daily needs. The application of pop-up architecture rather than traditional architecture is ideal for its adaptability to a city in constant movement, like São Paulo.

This research explores how pop-up architecture can improve the working conditions of delivery drivers while promoting their social inclusion and rights to the city, through qualitative and quantitative data, analyses of existing urban settings, and studies of types of pop-up architecture material and utilization.



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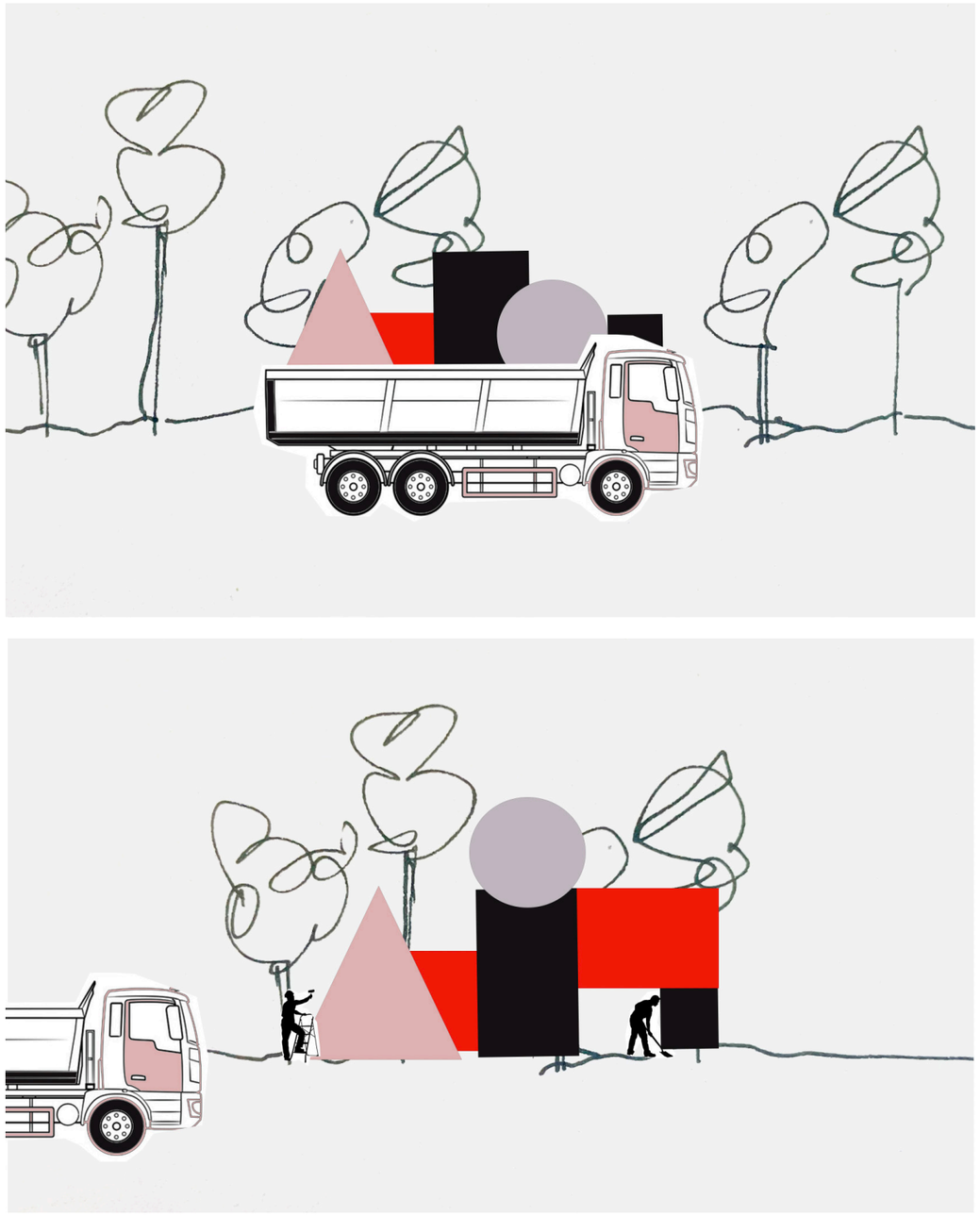
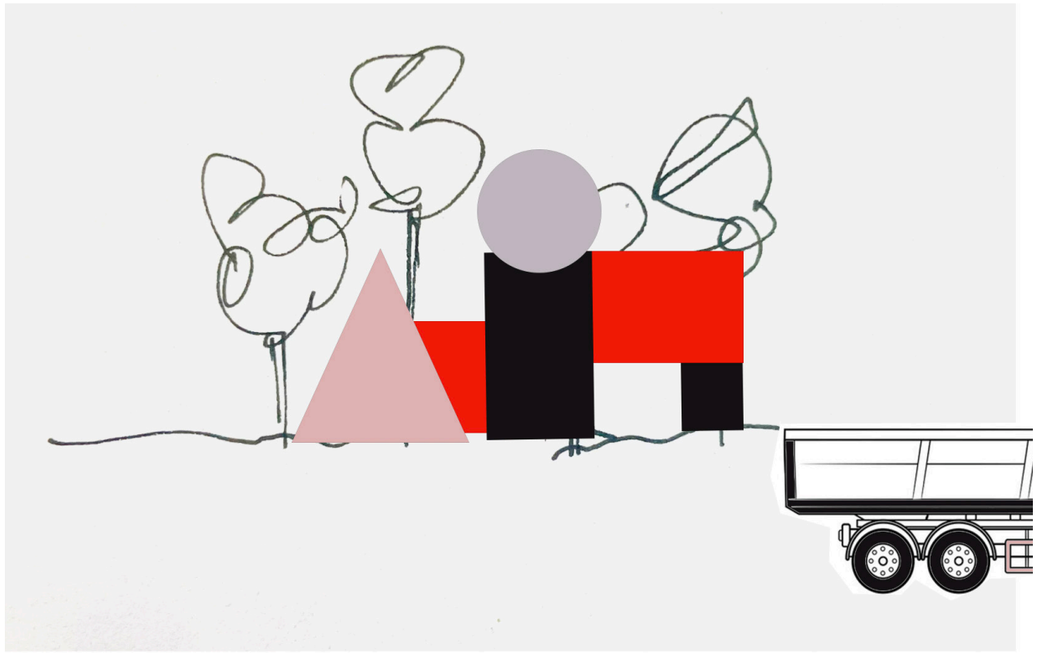
chapter 1



pop-up architecture



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pop-up architecture •

Pop-up architecture consists of easily assembled and disassembled structures, serving many purposes and adapting to different urban settings. They can be design for a range of programs, like stores, shelters, restaurants, and even hotels. While they [pop-up sructures] may go by different names, from temporary pavilions to flash retail, pop-ups share common qualities of scale and impermanence. (Baldwin, 2020)

Pop-up structures are usually made of small-scaled and light materials, and are often temporary, multi-functional, and easily transported to several destinations. Regardless of their purpose, their small scale and temporality features allow for freedom of form, unorthodox shapes, material innovation, and experimentation.

Figure 1 - The Walking House by N55, Copenhagen, Denmark.

"Pop-up, temporary, and mobile architecture have often sat well outside the boundaries of mainstream architecture, pushing the edge of progressive design. Architectural ideas that as a practical matter couldn't be built as permanent structures are possible as temporary structures"

Marni Epstein-Mervis

Figure 2 - Vertical Campsites for the Homeless by Studio Malka, France

Figure 3 - Brugge Triennale's Liquid City Pavilion by Segascano Architecture.

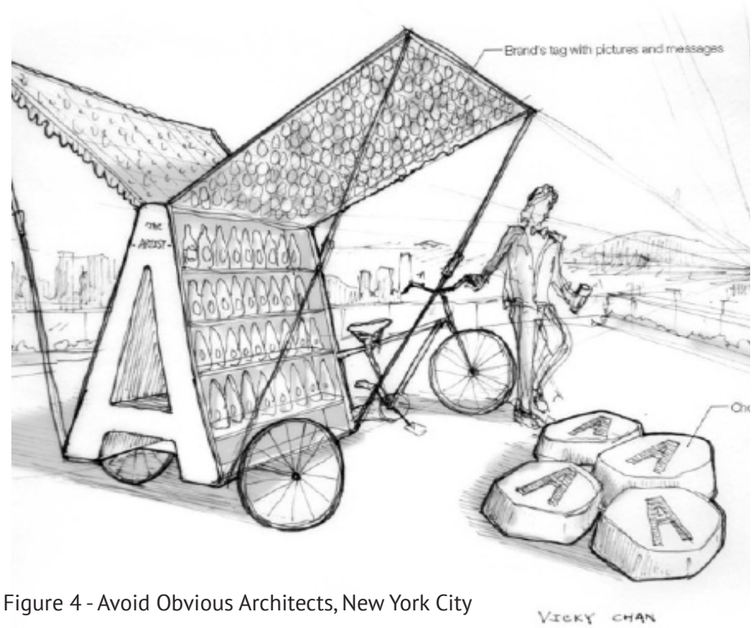

Figure 4 - Avoid Obvious Architects, New York City

pop-up architecture ● brief history

Although pop-up architecture is perceived as a recently adopted practice, there are many examples that show its existence throughout time. The Metropolitan Museum of Art notes that ancient Romans built spectacular wooden structures with intended life spans of just a few weeks to stage plays and celebrate their most important community festivals, or ludi. (Esptein-Mervis, 2016).

Epstein-Mervis also mentions in her article more recent experiments, like the Plug-In-City, a visionary creation designed in 1960's by radical British architecture group Archigram, "masterminded by Peter Cook himself, was a vertical, highly flexible metropolis that contained residential units and transit that were all movable by a giant crane… a wall of appliances could easily be detached and removed in favor of a new one in the event an oven broke". (Epstein-Mervis, 2016).

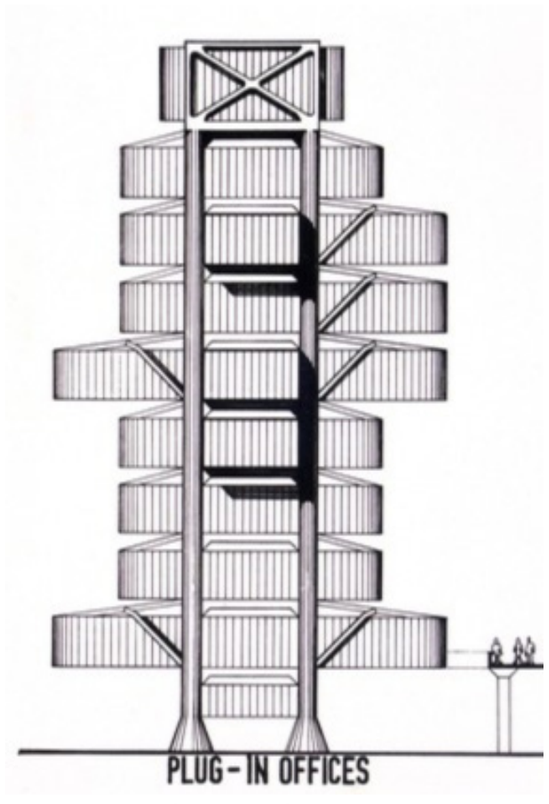

Figure 5 - Plug-In City by Peter Cook

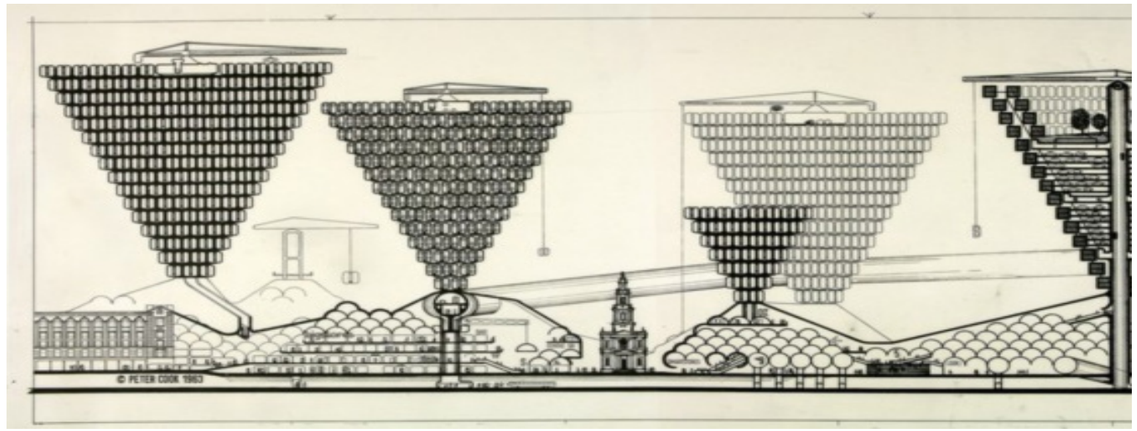

Figure 6 - Plug-In City by Peter Cook

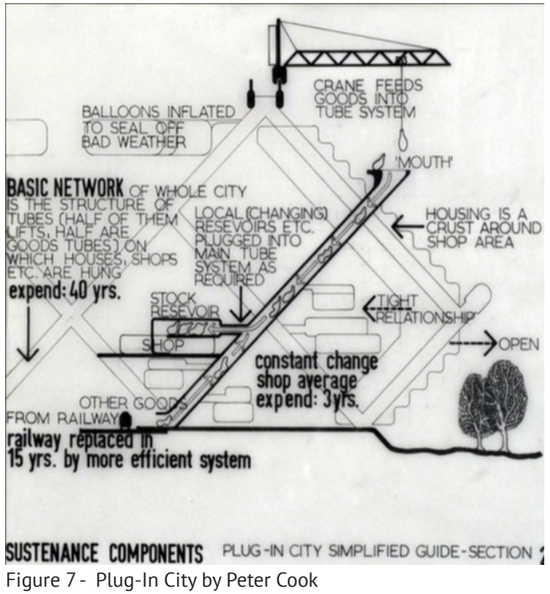

Figure 7 - Plug-In City by Peter Cook

pop-up architecture • experimentation

Apart from having a specific function or use, many renowned architects today are finding in pop-up architecture a way to design statement pieces. Famous establishments, like the Serpentine Galleries in London, invite top designers every year to create and conceive a summer pavilion. According to architecture journalist Christopher Dewolf, "freed from the shackles of permanence, architects have the freedom to experiment with materials, respond quickly to urgent situations and adapt in real-time to the needs and habits of the people who use their spaces."(Dewolf, 2017)

Figure 8 - 2015 Pavillion at the Serpentine Gallery, Kensington Gardens, London. The colorful plastic pavilion designed by SelgasCano.

pop-up architecture • human-centered

Pop-up architecture has been perceived as a solution for world-pressing problems and urban growth challenges in need of quick solutions. In “Pop-Up City, City-Making in a Fluid World”, Beekmans and de Boer state that architecture has historically addressed as disciplines three dimensions: height, length, and witdth, which are the base for all design tools and methods; however, the authors add that a fourth dimention has playing a more important role in urban practice: time, which, according to them, is what sets pop-up design apart from conventional architecture. (Beekmans and de Boer, 2014).

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Pop-up design has also become a transformative tool in responding to the needs of displaced populations victims of natural disasters and forced immigration. For example, the Maidan Tent, located in a refugee camp in Greece, (Figure 9), has been designed to provide refugees a communal space, addressing the social, emotional, and practical needs of individuals and families, providing them a sense of normalcy, commmunity, and support in such challenging circumstances.

How can pop-up architecture advocate and respond to spatial justice challenges faced by delivery drivers in São Paulo, improving work conditions and fostering long-term positive social and economic impact?

Figure 9 - The Maidan Tent, designed by architects Bonaventura Visconti and Leo Bentini. Ritsona Refugee Camp, Greece.

Figure 10 - Maidan tent as a communal area.

Figure 11 - Refugees at Maidan Tent in cultural activities.

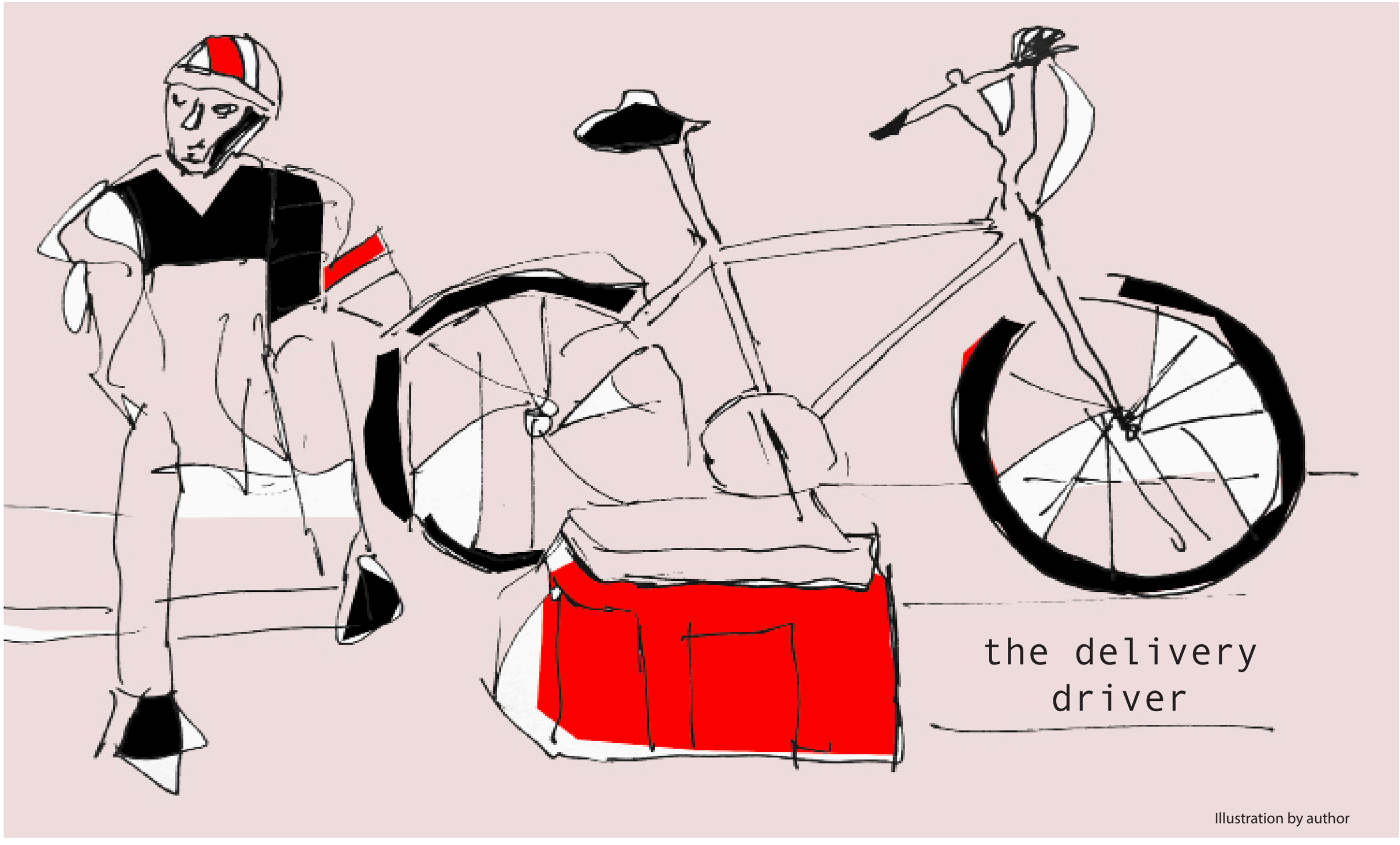


Illustration by author

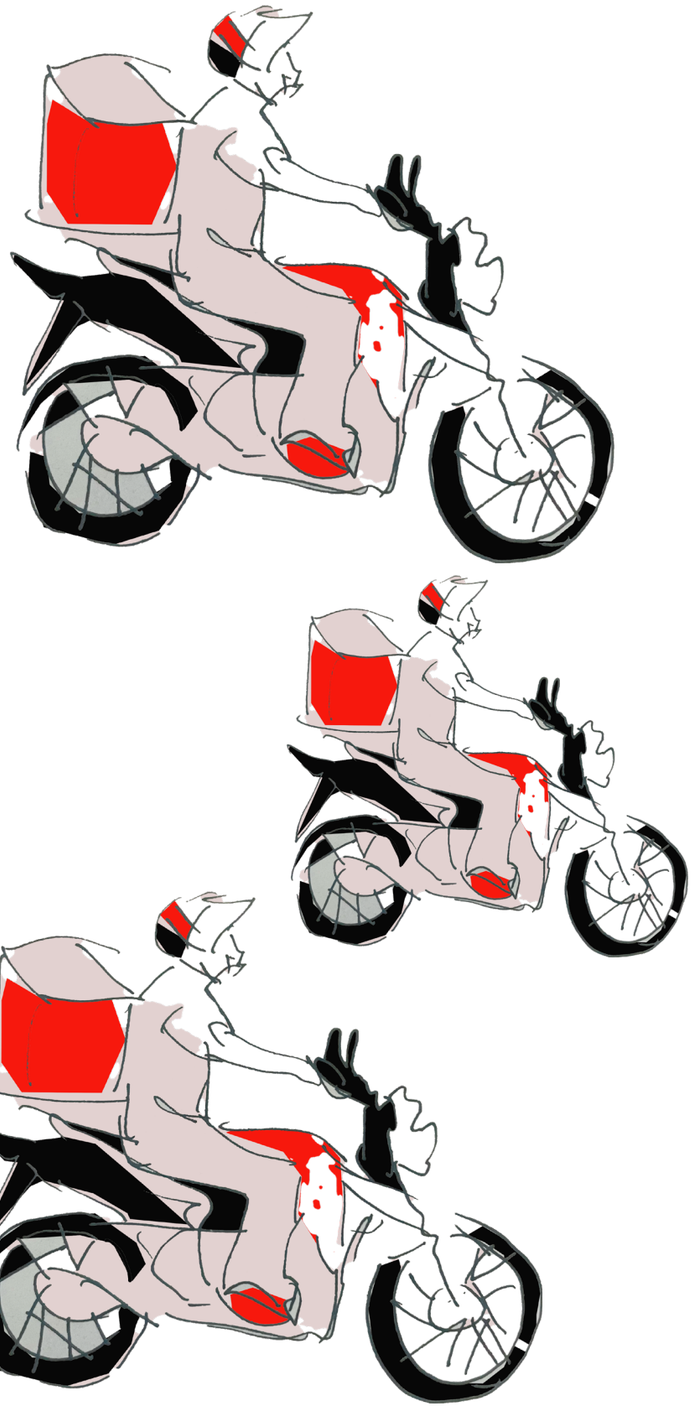
the delivery driver

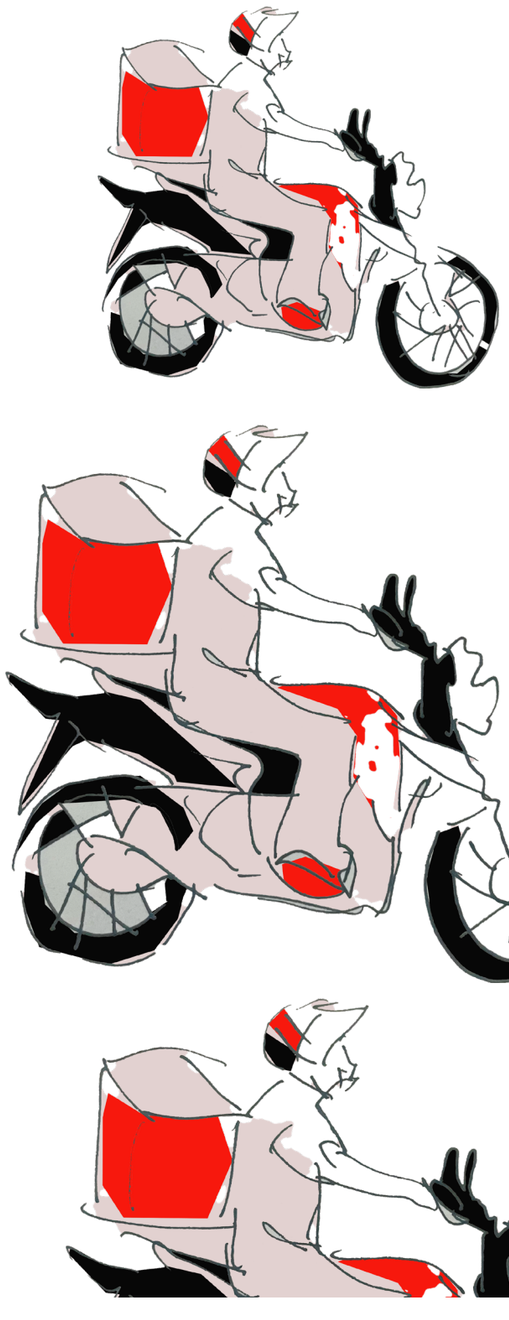
Delivery drivers in Brazil, like in many other countries, play a crucial role in the economy by ensuring that goods are transported efficiently from sellers to buyers. In Brazil, the demand for delivery services, has grown significantly, especially after the social isolation resulted from the Covid-19 pandemic. Apps like iFood, Rappi, and Uber Eats have created a booming market for food delivery, requiring a large fleet of drivers to fulfill orders from restaurants to customers' doorsteps.

Delivery drivers in Brazil face various challenges, including traffic congestion, poor road conditions, and safety concerns, particularly in certain urban areas. The Brazilian government has implemented regulations to address some of these concerns. For example,there are regulations governing the use of motorcycles for delivery purposes, including licensing and safety requirements.

Despite challenges related to infrastructure and safety, delivery drivers face a lack of designated places to take breaks. This absence forces them to rest on sidewalks or public spaces without protection from weather and basic needs like water and restrooms. Their agglomeration in public spaces and sidewalks has received negative attention as delivery drivers are often perceived as belonging to lower socioeconomic classes and to low-skilled services, resulting in prejudice and stigmatization from other segments of society.

Figure 12 - The Delivery Driver





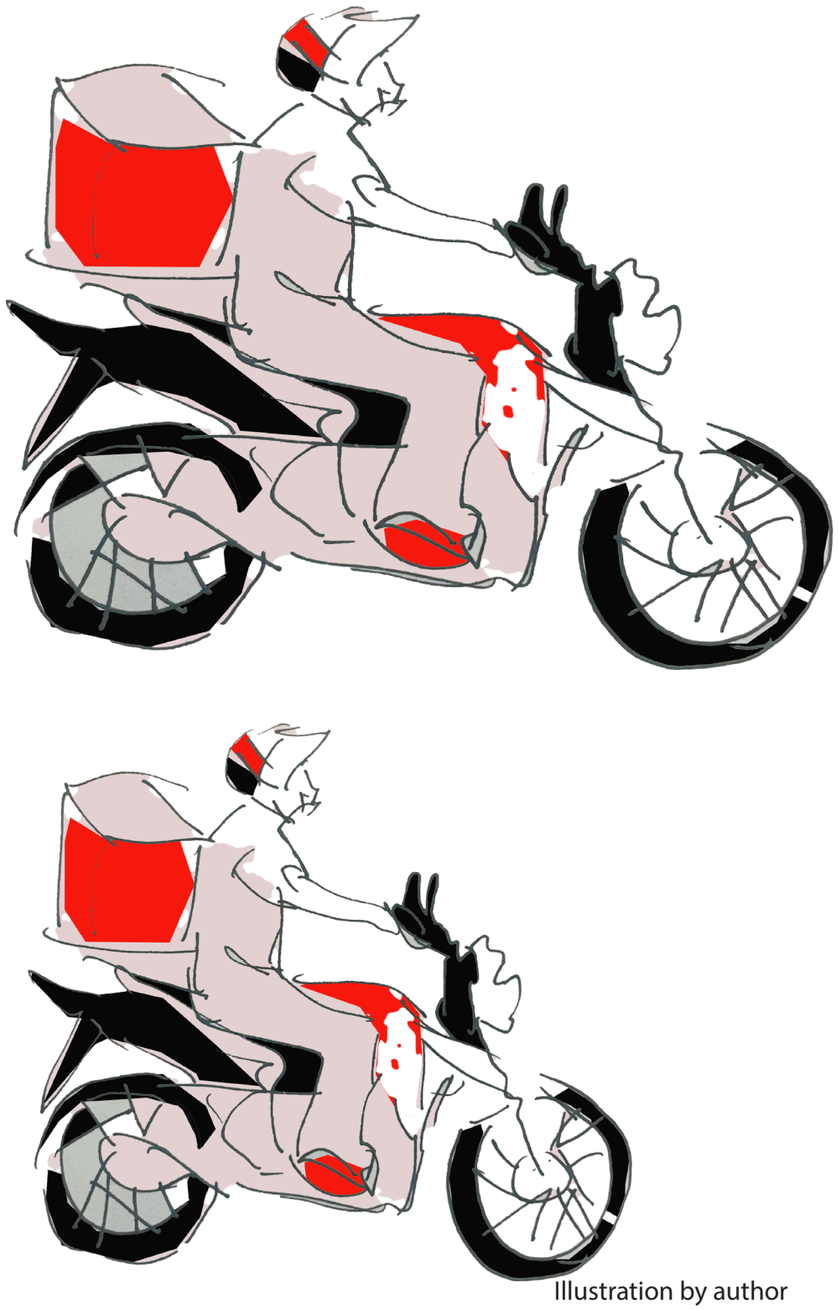


Illustration by author

the delivery driver • demographics

Who is the delivery driver in Brazil?

There are today 1,660,023 people working as delivery drivers through an app plattform in Brasil.

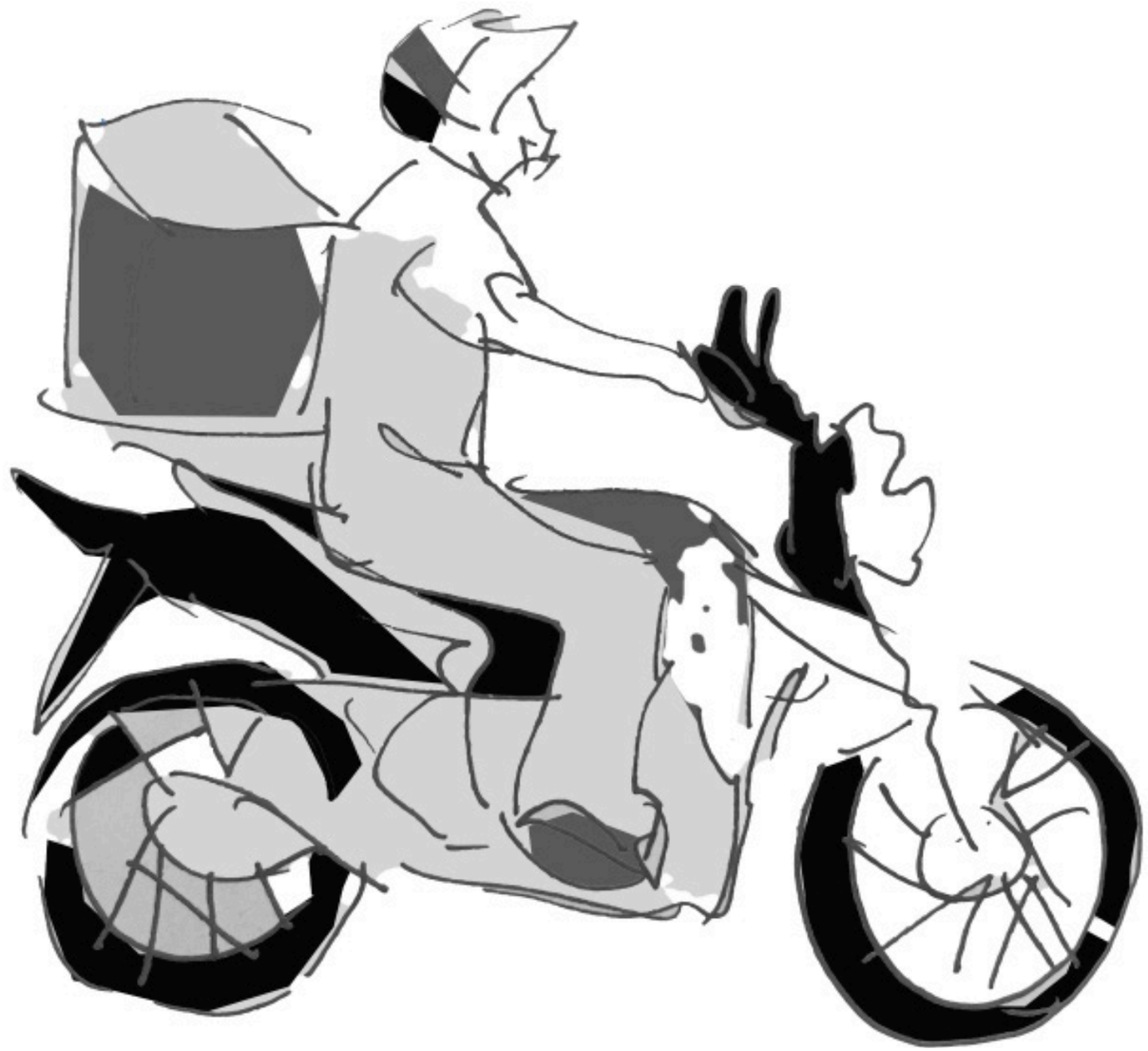
Delivery driver

• The average age of delivery drivers is 33 years old;
• 59% of them have completed high school;
• 68% are black or brown, 29% are white, 2% are yellow, 1% are Indigenous;
• 97% are male, 3% are female.

Previous income source

• 26% had previous occupations but left to become full-time delivery drivers;
• 31% had previous occupations and kept them, even after becoming a delivery driver.
• 28% were looking for a job

*minimum monthly wage in Brazil is currently close to $250).



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Willingness to stay in the job

• 63% want to keep working as delivery drivers
• 15% really want to keep working as delivery drivers
• 11% would like another job

Income

• The monthly average income for delivery drivers varies between
R$ 1,980 to R$ 3,039 ($400 - $600)*.

the delivery driver • demographics

Chart 1 - Delivery Drivers in Numbers

Category	
Total of app drivers	1,274.281
Food Delivery Drivers	385.742

Source : Registros administrativos, Amobitec.

Chart 2 - Deliver Driver by Gender

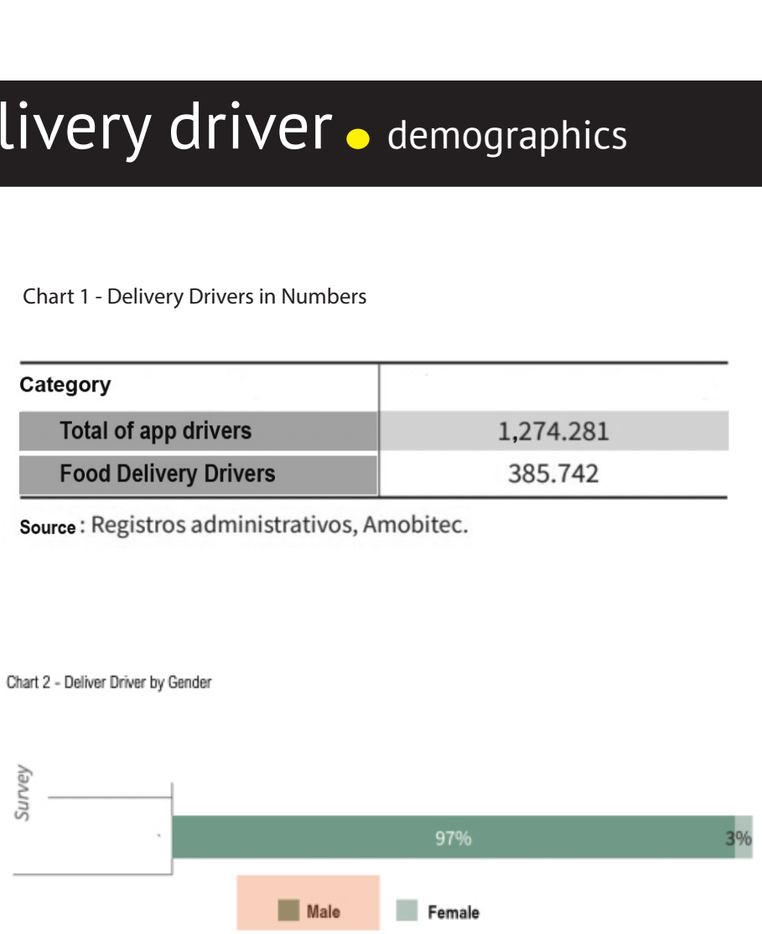


Chart 3 - Deliver Driver by Race

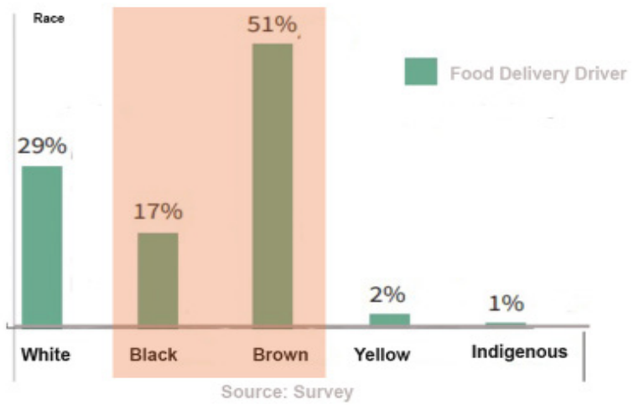


Chart 4 - Deliver Driver by Age Group

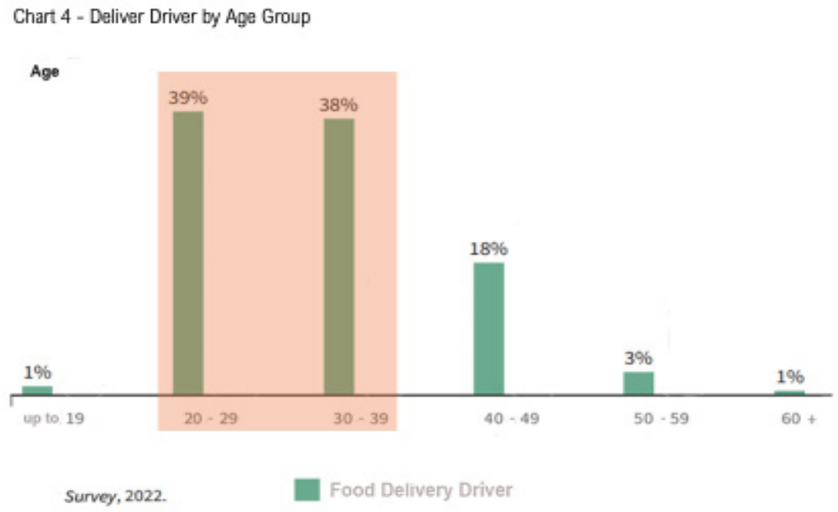
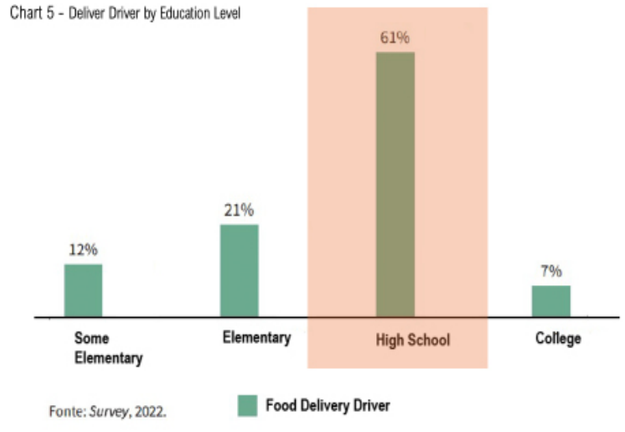


Chart 5 - Deliver Driver by Education Level



chapter 3

spatial justice

Fig. 13 - Illustration from Learning UCLG

spatial justice • the right to the city

The situation of delivery drivers in Brazil highlights how space and place impact social equality and well-being. The lack of access and right to the space are variables that significantly contribute for the high level of inequality. The unveven, unfair, and unjust distribution and access to space developed the concept know as Spatial Justice. Spatial justice addresses the fundamental right of individuals to a space that supports their well-being and fosters community. (Cuff, 2023).

The situation of delivery drivers has become one of Brazil's most pressing problems concerning spatial justice. São Paulo, the largest and richest city in Brazil, also stands out for high levels of social-economic inequalitties. According to geographer Rafael Pereira, there is a pattern that aggravates this inequality: the white and high income population find the access to job opportunities and services to be closer to their homes. He also points out that "either by walking, using public transportation, or bicycling, it is a lot easier for these people to access job opportunities, healthcare, and education. (Pereira et al, 2019).

Figure 14 - Delivery Driver resting at supermarket parking garage.

"The spatiality of (in)justice has been neglected for too long. In seeking justice, we must acknowledge and address the geographical dimensions of social inequalities."

Edward Soja - Spatial Justice Theorist.

Fig. 15 - Delivery Driver resting on sidewalk.

Fig. 16 - Delivery drivers resting on sidewalk.

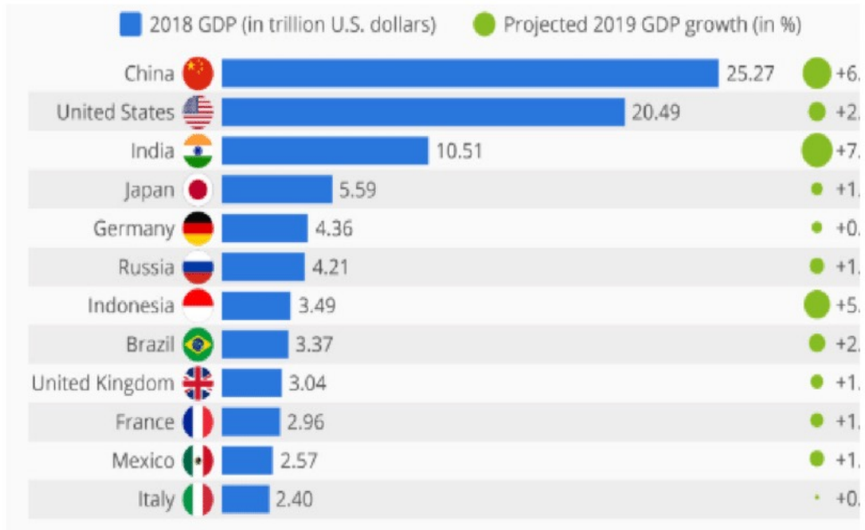
Resident of an affluent neighborhood (Fig. 17) whipping a delivery driver who was resting across her condo. She claimed she paid the taxes for that space and he should not be there. This event got national attention, but it is not an isolated case.

Fig. 17 - A delivery driver being assaulted by a neighborhood resident. April 2023.

spatial justice - understanding inequality in Brazil

Many countries face spatial justice challenges, often due to wealth accumulation and social and economic disparities. Although Brazil has been ranked among the 10 biggest economies in the world, it has also been ranked as the most unequal country in Latin America, according to the Gini coefficient (Figure 18).

Figure 18 - 10 Biggest Economies in the World



Source: IMF; The European Sting; https://europeansting.com/2019/12/23/in-2020-asia-will-have-the-worlds-largest-gdp-heres-what-that-means/

Figure 19 - Income Distribution Inequality based on Gini Coefficient in Latin America, by Country

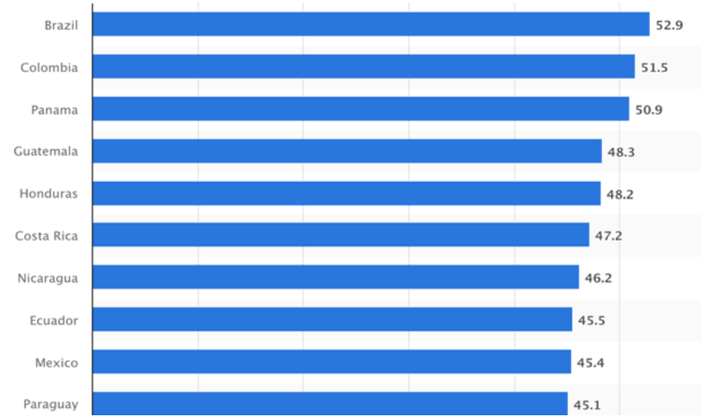


Figure 20 - Brazil's Wealth Distribution - 2021

In Brazil, from the total national wealth share in 2021, the top 1% of the population held almost half of Brazil's wealth, nearly 80 percent belonged to the top ten percent. On the other hand, the bottom 50 percent had a total of -0.4 percent, that is, on average, this group had more debts than assets.

Spatial Justice - the city of São Paulo

The city of São Paulo is divided in 32 sub-prefectures.

Population: 11.451,999 inhabitants
7.528,26 inhabitants per sm2

Source: IBGE 2020 Census

Figure 21 -Stayed Bridge in Brooklyn Financial District

Figure 22 - Moder Art Museum of São Paulo (MASP)

Figure 23 - Map of Brazil

Figure 24- Fara Lima Avenue

São Paulo is the largest and most populous city in South America with 11.5 million inhabitants, it holds the largest number of immigrants in the country.

Brazil is considered the financial, economic, and cultural center of Brazil. Main challenges are air pollution, traffic, crime rate, and homelessness.

spatial justice - job posts and income level in São Paulo

Figure 25. - Aerial View of São Paulo

Figure 26 - São Paulo Paulo Income Concentra-

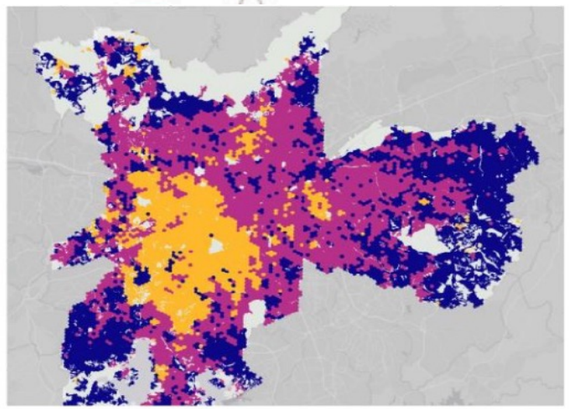
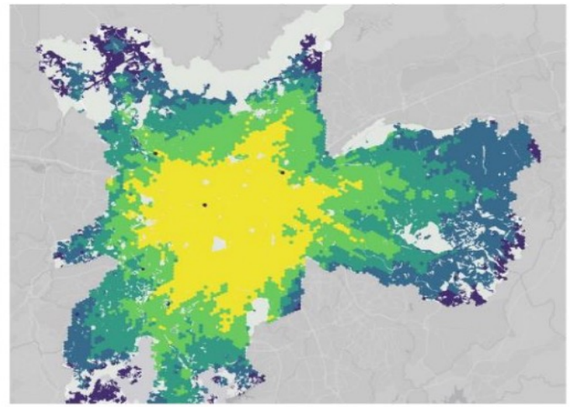
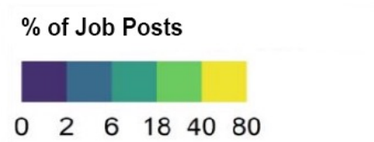


Chart x - São Paulo Paulo Job Accessibility



Source: Centro de Estudos da Metrópole (CEM-Cepid/Fapesp)



Concentration of families by income level and access to job opportunities in the city of São Paulo.

Low-income population of the city of São Paulo (in blue) predominantly lives on the city's outskirts, the middle class (in pink) lives between the outskirts and the core, and the high-income population (in yellow) is located in the centralized region of São Paulo.

On the right map, you see the accessibility for job opportunities, which goes from 0 to 80%. We can observe that 80% (in yellow) of job opportunities are offered in high-income level areas, and that only 0-2% of job opportunities are offered at low-income areas.

Figure 27 -Delivery drivers gathering at public sidewalk

How can a pop-up structure provide delivery drivers a place to feel valued, respected, and part of the space where they work and live?

Illustration by author

pop-up architecture - toward a solution

Because of the changing conditions of the driver and the city, permanent architecture solutions may not be adequate; in fact, providing a nimble, relocatable, dispatchable solution fits the problem, and pop-up architecture allows us to do that.

Among all the advantages brought up by a pop-up structure, the decisive features in selecting pop-up architecture for this project were:

01 - **Flexibility and mobility**

Pop-up structures are designed to be temporary and easily relocated. This flexibility allows them to adapt to changing needs and environments, making them adequate for a city in constant move, like São Paulo.

02 - **Quick Deployment**

Pop-up structures can be quickly assembled and disassembled, reducing construction time and minimizing disruption to surrounding areas. This rapid deployment is advantageous for time-sensitive projects, which is the current situation of the delivery drivers.

Figure 28 - Module transportation

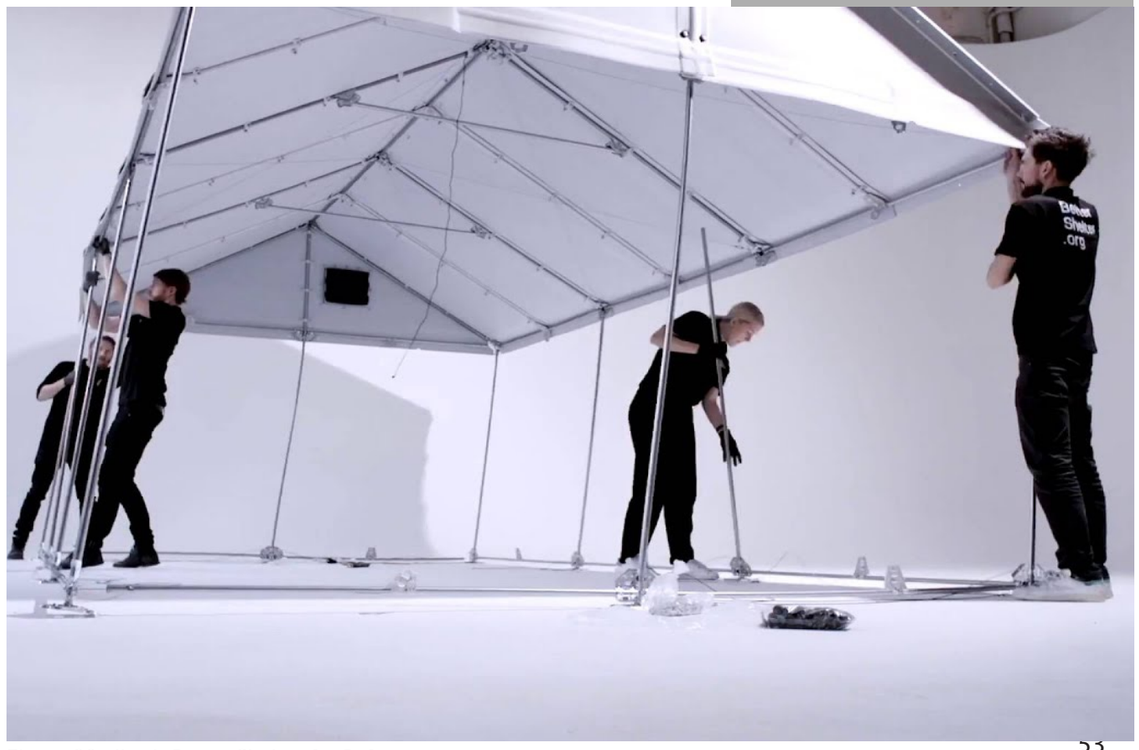


Figure 29 - Ikea's Better Shelter for Refugees

pop-up architecture - toward a solution

03 - **Adaptability**

The pop-up design can be installed in several locations within urban settings. This adaptability is adequate for this project as it allows for greater accessibility for drivers and reaches different types of communities.

04 - **Engagement and Interaction**

Pop-up structures often attract attention and create a sense of novelty. They can serve as focal points for community engagement, cultural events, promoting social interaction and dialogue.

Figure 30 - Brugge Triennale's Liquid City Pavilion by Segascano Architecture

Figure 31 - One Bucket at a Time social project, by 5468796 Architecture, Mexico City

precedented study - day labor station

The Day Labor Station is a project designed by architect Liz Ogbu in a project for the social impact design firm Public Architecture. This project addresses day laborers who usually wait for work under unfavorable weather conditions without any protection, water, or seating. The design provides them with a meeting space, a learning environment, and restrooms, among other amenities. The Day Labor Station is not only a physical improvement for the Day Laborers, as it is also a place for socializing, exchanging ideas and jobs, and learning new skills. Although this project is unbuilt, it represents an attempt to solve the same problems that this pilot does.

Figure 32 - Day labor station garden

Figure 33 - Day labor station

Figure 34 - Day labor station

specific needs

Creating an ideal rest stop for delivery drivers involves understanding their specific needs for comfort, safety, and convenience during breaks. Some essential amenities and features that would benefit delivery drivers include restrooms or close distance to restrooms, a lounge area with charging stations for cell phones or other electronic devices, a bike shop for minor fixes like an air pump and basic tools, a multi-space for classes and small events or social gatherings, and a kitchenette for heating food, coffee, and water.

By incorporating these amenities, a rest stop for delivery drivers can significantly enhance their well-being, safety, and overall experience, improving job satisfaction and providing a sense of self-worth.

Figure 35 - lounge

Figure 36 - cell charge stations

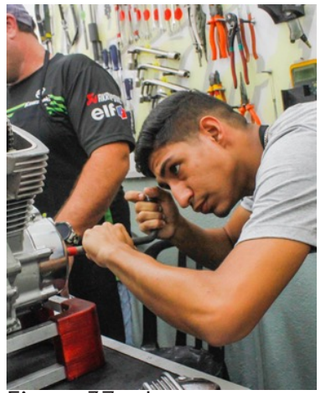


Figure 37 - shop

Figure 38 - learning center

Rest/social area
Charging station
Kitchenette
Repair/maintenance shop.
Multi-use space for classes and meetings.

chapter 4

project proposal:

Provide delivery drivers a space equipped with basic physical/structural needs in an inclusive and learning-sharing environment.

Illustration by author

project proposal - project goals

Lack of a work support system

Create a network of rest stops in areas of high-volume of orders

No dedication space for weather protection, heat meals, restrooms, breaks, and waiting for calls

Build rest stops that correspond to the delivery drivers' needs and provide a sense of belonging and respect.

Restrooms and rest areas are fixed and limited.

Build easily transported, assembled, and disassembled structues througout Sao Paulo.

Lack skills to purse other job opportunities.

Provide a learning environment for professional and personal growth and increase opportunitites in other areas

project proposal - location research

In the research for adequate areas to place the rest stops, dimensions and height were understood to be constraint factors in allocating rest stops equally throughout the city. The Parklet Operational Manual for the City of São Paulo helped to set the dimensions for the rest stops.

Parklets are small public spaces created from exisiting parking spots, they would be adequate for the rest stops as they are spread out over the city in different urban environments and communities. Moreover, structures placed on parkelts are usually perceived as novelty, attracting attention of the community and pedestrians that walk by.

Parklets are a place for pedestrians to hang out, occupy the public space, encourage interactions with strangers, and encourage people to slow down (Groundplayf.org).

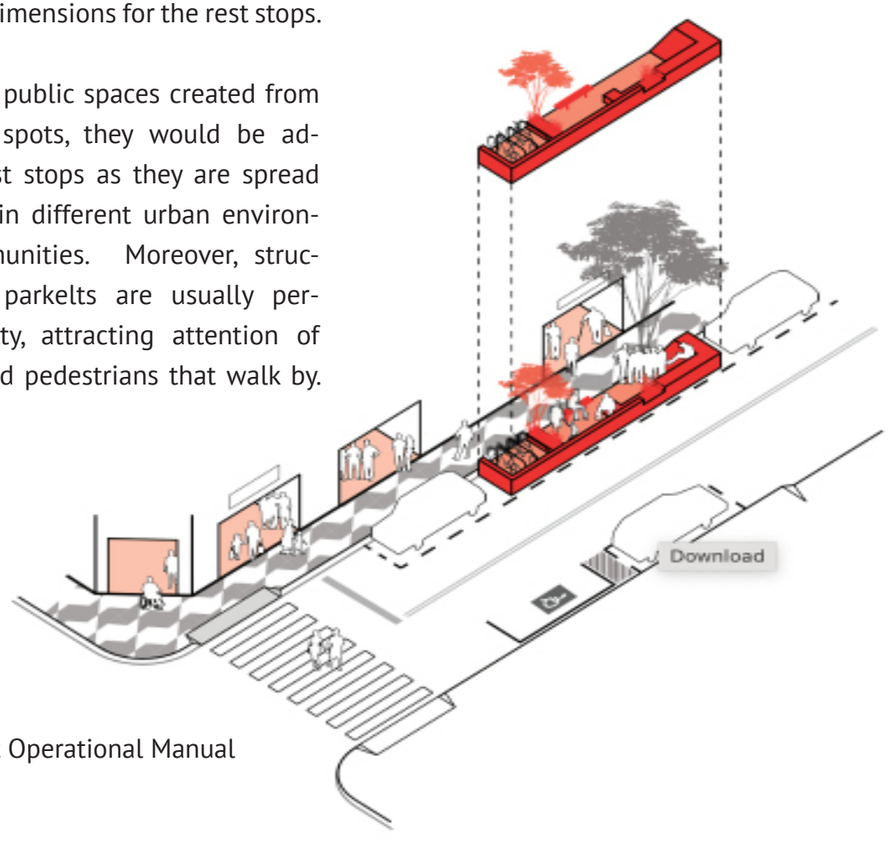


Figure 39 - Parklet Operational Manual

Figure 39 - Street Parklet

Figure 40 - Street Parklet

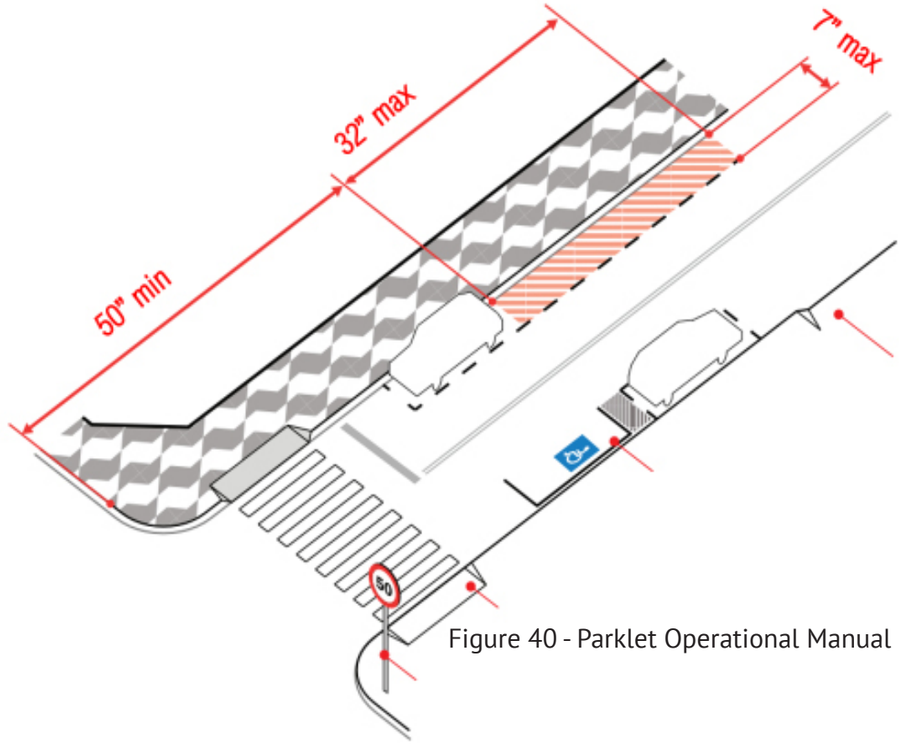


Figure 40 - Parklet Operational Manual

Parklet Operational Manual

project proposal - architectural modules

Modular architecture seemed adequate for the structure of the rest stops due to its relocatable, flexible, and adaptable features.

Architectural modules usually refer to standardized, prefabricated building units that can be dispatchable and assembled to form a structure. The use of modular architecture offers numerous benefits including faster construction time, reduced on-site labor, standardization, and customization.

The benefits of architectural modules go beyond the construction process type, like energy efficiency and sustaintability, becoming solutions for projects that focus on the use of natural resources for they operation and well-being.

The Nagakin Capsule Tower (Fig. 41) was composed of 140 capsules stacked and rotated at varying angles around a central core. The module was created with the intention of housing traveling businessmen that worked in central Tokyo during the week. It is a prototype for architecture of sustainability and recycleability, as each module can be plugged in to the central core and replaced or exchanged when necessary. (Sveiven, 2011).

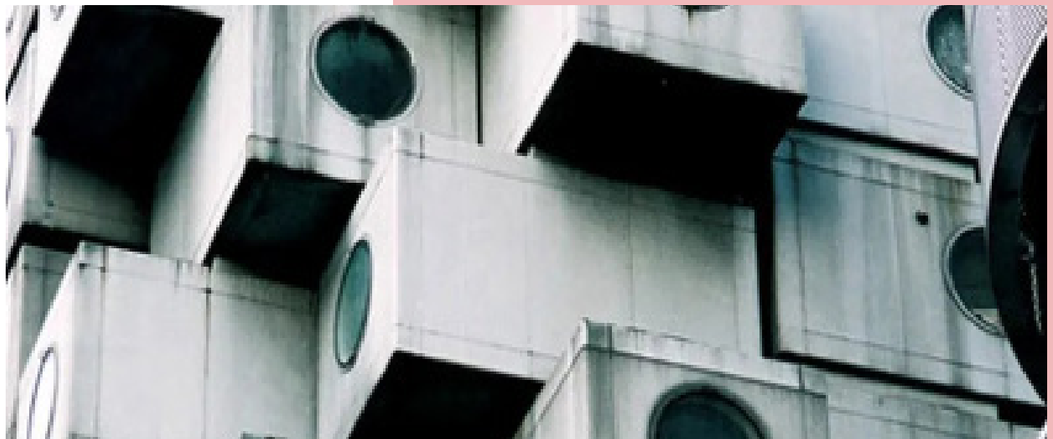


Figure 41 - Nakagin Capsule Tower, Ginza, Tokyo.

Figure 42 - Nakagin Capsule Tower, Ginza, Tokyo.

project proposal - architectural modules

Architectural modules can be produced in different types, according to construction needs and operation. The three most common types of architcteral modules are volumetric, panelized, and hybrid.

Volumetric modules are usually structures composed of all building elements like including walls, floors, ceilings, and internal finishes. It is commonly used for residential units, hotels, schools, office spaces.

Panelized modules are composed of pre-fabricated panels, such as walls, floors, roof elements, and windows, which are assembled to become a whole structure. Structural insulated panels (SIPs) and pre-cast concrete are examples or panelized modules.

Hybrid modules are a combination of volumetric and panelized. They are usually used when there is a need for flexibility and consistency (repetition).

Hybrid modules in a combination of voluetric and panelized seemed adequate to satisfy the purpose of this project as it allows flexibility and standardization.

Figure 43 - Architectural module stack up

Figure 44 - Architectural module in construction

project proposal - architectural modules

The deliver driver's module is compose of a hybrid of volumetric and paneling, comprised of two volumetric modules sizes and panels for windows, acoustics, walls, roofs, and floors (Fig. 46). The module stacking is composed of three joint techniques (Fig. 47).

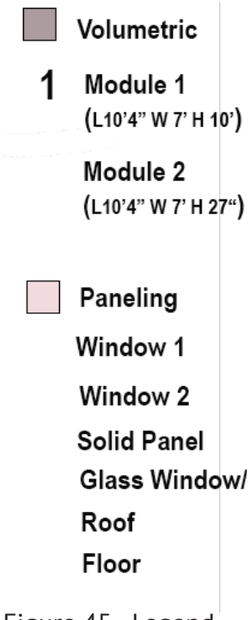


Figure 45 - Legend

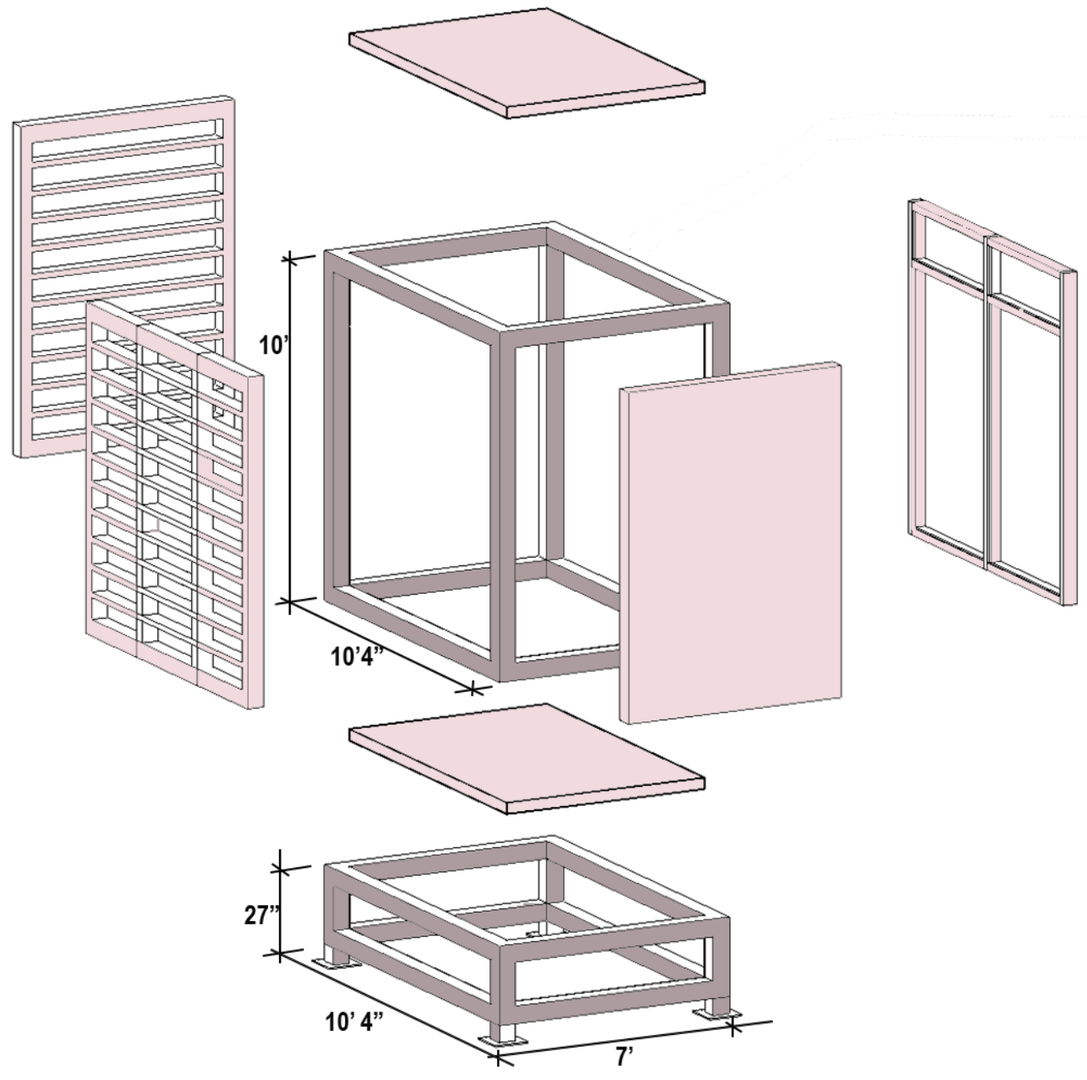


Figure 46 - Architectural module for rest stop

project proposal - joint types

Joints play a crucial role in this modular construction as they connect one module to each other to compose a single structure, depending to the needs and size desired for the rest stop. The types of joints used in this architectural module are a hybrid of bolted with interlocking joints. They are divided in Lateral Joint (Fig. 48), Corner Joint (Fig. 49), and Middle Joint (Fig Fig. 50).

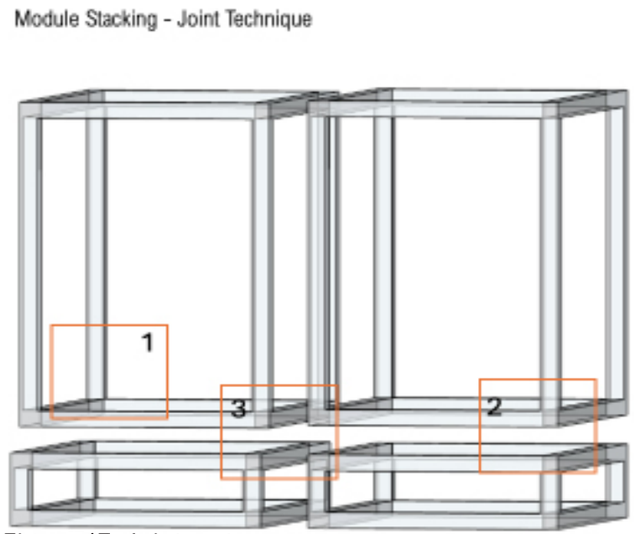


Figure 47 - Joint system

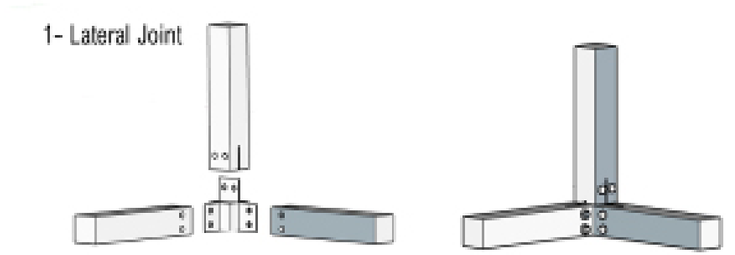


Figure 48 - Module lateral joint

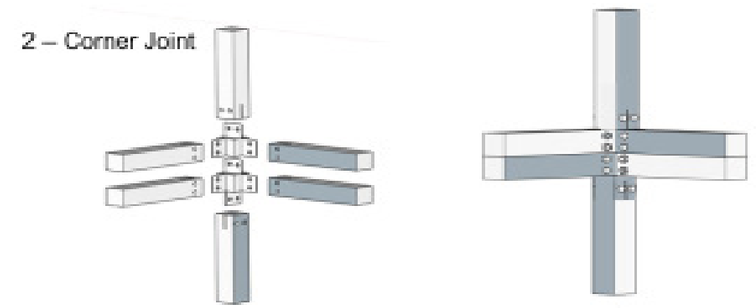


Figure 49 - Module corner joint

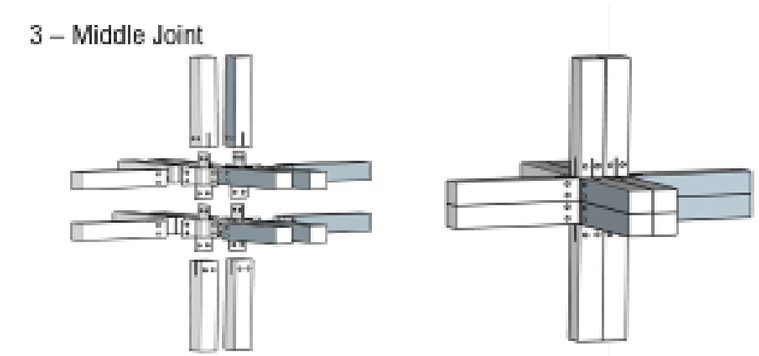


Figure 50 - Module middle joint

project proposal - Location / short stop (5-15 min) / large avenues in main business districts

Modular structures are adequate for implementation in different urban settings throughout the city. Thus, two rest stops location approaches have bee suggested for the rest stops.

The first suggestion places the rest stops along large avenues in main business districts, and are meant for a short stop of 5-15 minutes. Faria Lima Avenue, Paulista Avenue, and Berrini Avenue are some examples. The right-sided map shows their location within the driver's working area.

Figure 51 - Faria Lima Avenue

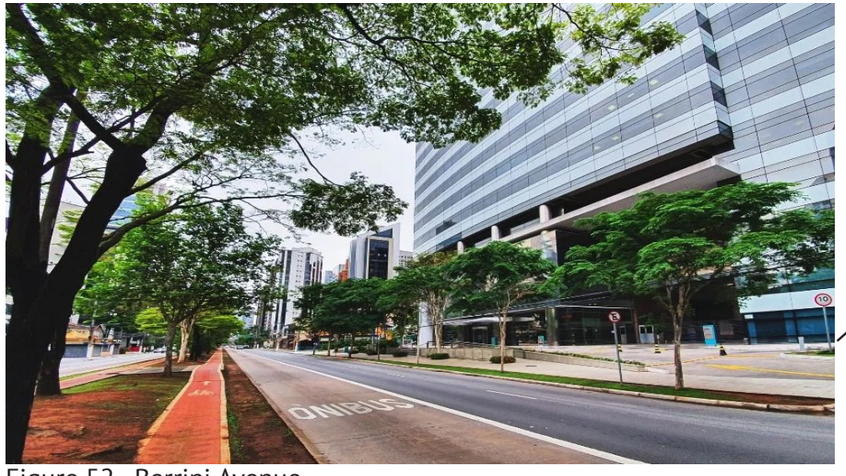


Figure 52 - Berrini Avenue

Figure 53 - Map of São Paulo (city)

Figure 54 - Paulista Avenue

project proposal - Location / short stop (5-15 min)

The example of Paulista Avenue is used to better elucidate the application of the modules in this setting.

Avenida Paulista stretches 2.8 kilometers (1.7 mi) and runs northeast to southwest (fig. 57). The headquarters of many financial and cultural institutions are located on Paulista Avenue, it is not only seen as a symbol of the center of the economic and political power of São Paulo but also a place known for political contests and cultural manifestations The insertion of the rest stops in a highly politcal and social scenario, is likely to boost the attention and interest toward these professionals.

Figure 55 - Paulista Avenue

Figure 56 - Location of avenues in map

Figure 57 - Paulista Avenue extention

project proposal - Location / short stop (5-15 min)

The parking spaces found along Paulista Avenue are bigger than regular parking spaces as they are meant for small trucks and vans only. They were about 10 feet wide by 46 feet long and could be adequate to fit the proposed rest stops.

Figure 58 - Paulista Avenue - parking spaces

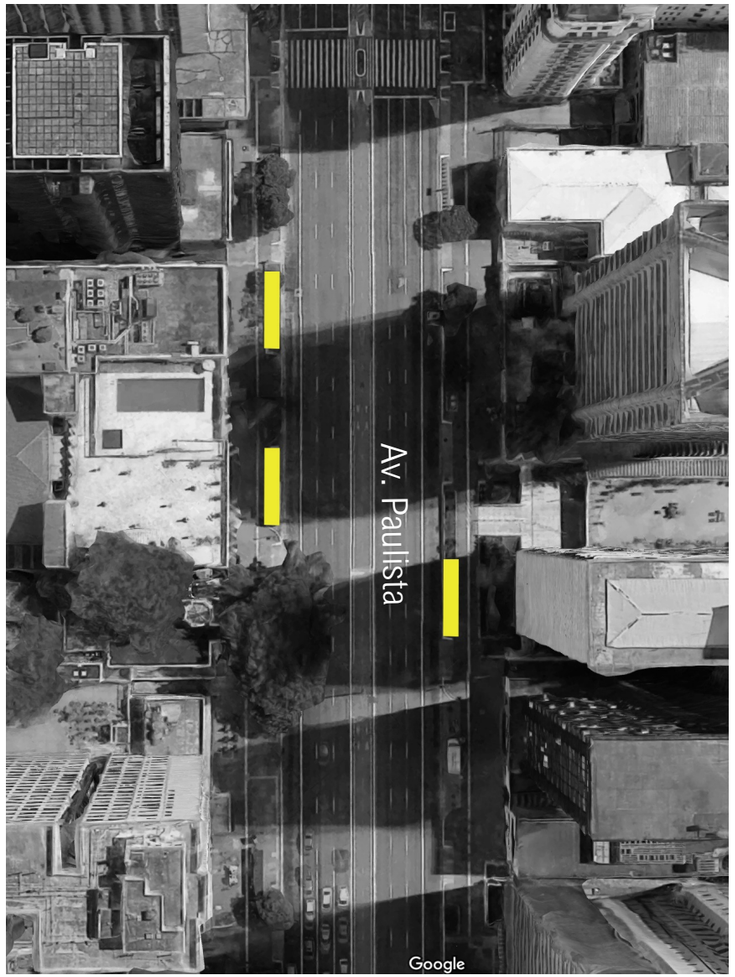


Figure 59 - Paulista Avenue - parking spaces

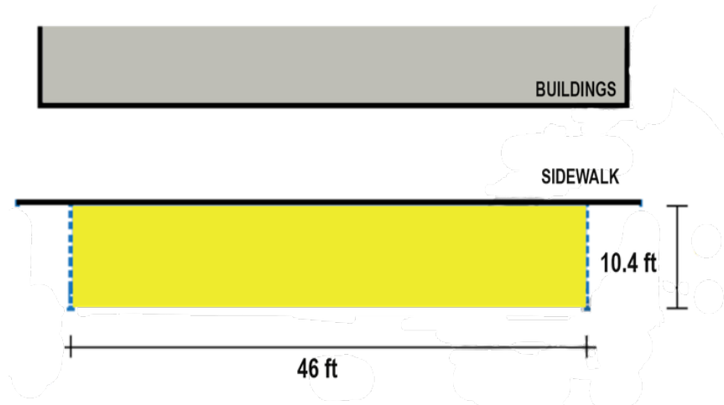


Figure 60 - Parking space dimensions

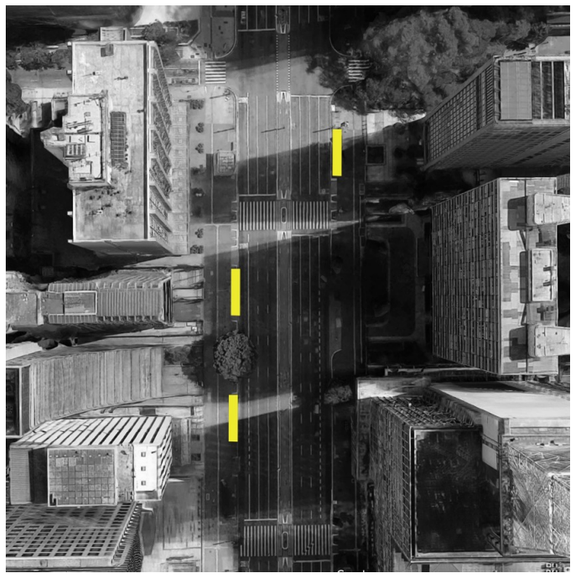


Figure 61 - Paulista Avenue - parking spaces

project proposal - Location / short stop (5-15 min)

These parking spaces are adequate to fit the modules, and because of space constraints, The fast-stop approach allows space for one to five modules only, which should be arranged horizontally.

Street Parklet – 10’ x 46’ – Avenida Paulista

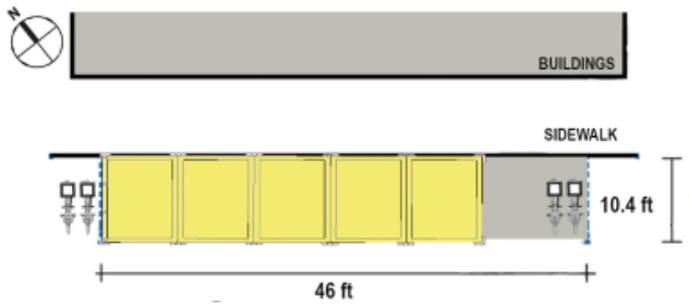


Figure 62 - Modules simulation in parking spot

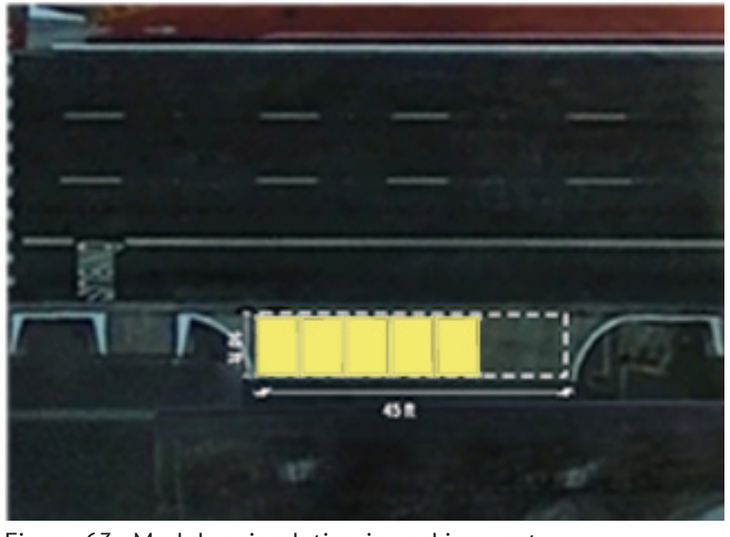


Figure 63 - Modules simulation in parking spot

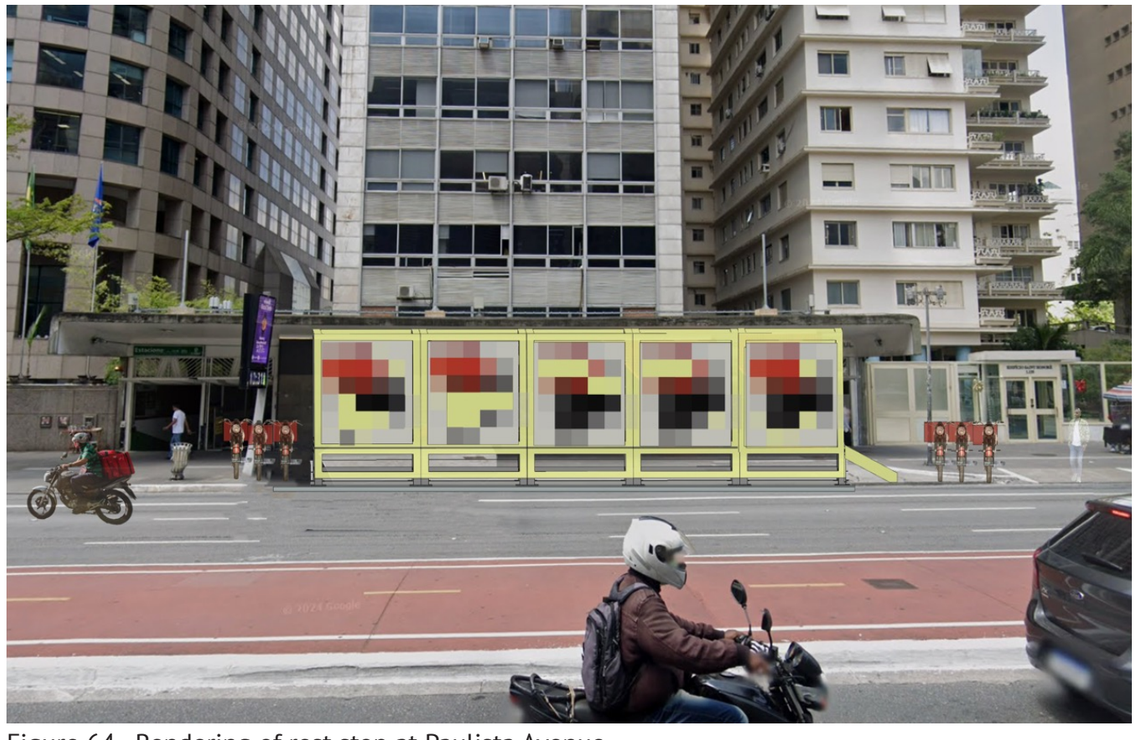


Figure 64 - Rendering of rest stop at Paulista Avenue

project proposal - Module interior

Figure 65 - Rendering of module interior

The street module has manually operated windows turned to the sidewalks, providing light and ventilation, and solid acoustic panel walls on the street side to block the traffic noise.

project proposal - Module interior

Figure 66 - Rendering of module interior

project proposal - section

Module 1
(L10'4" W 7' H 10')

Module 2
(L10'4" W 7' H 27")

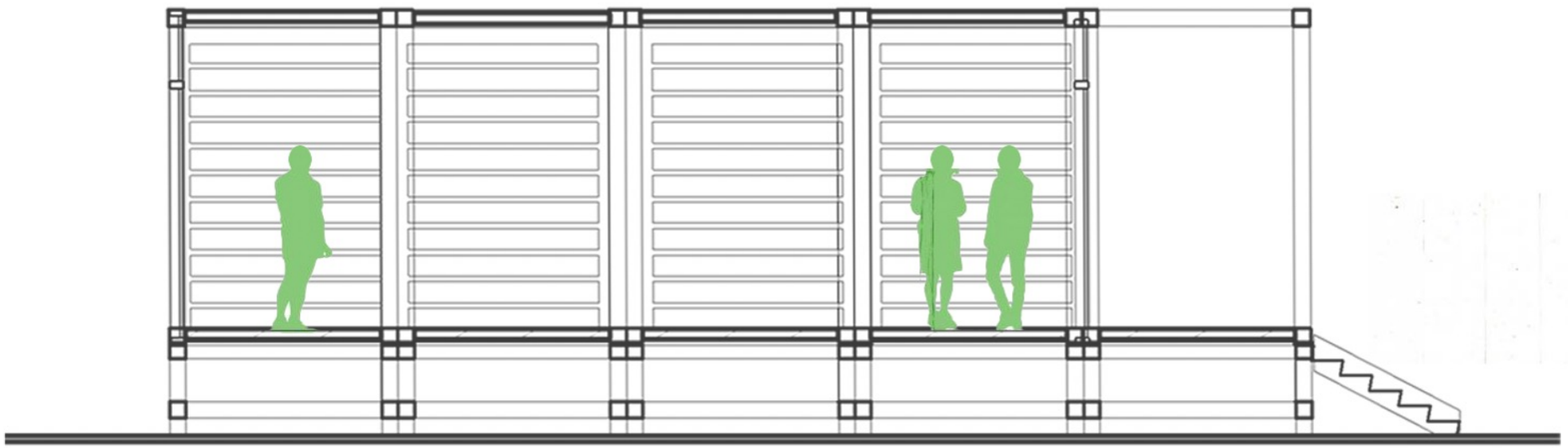


Figure 67 - Module section

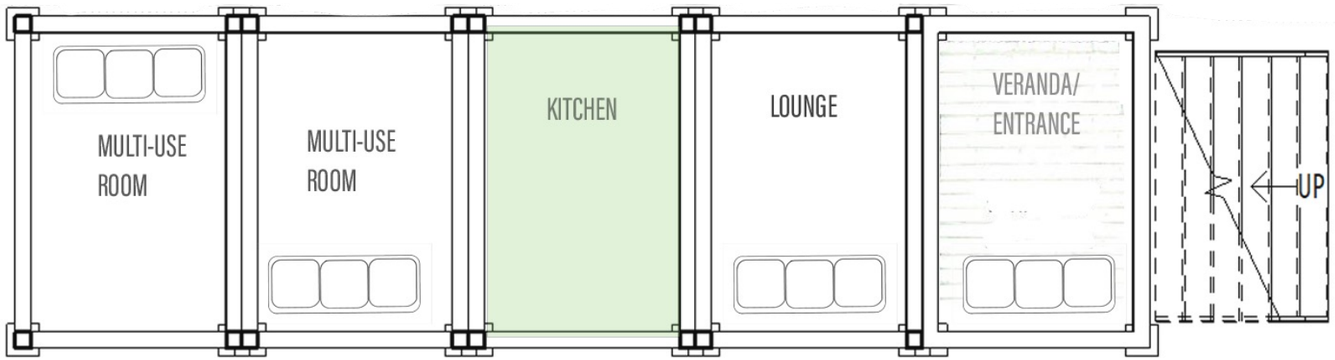
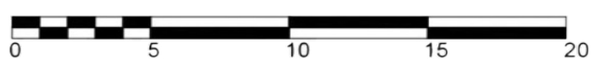


Figure 68 - Module floor plan



project proposal - Restroom Option

RV Toilet
Composting Toilev

Although this project aims to allocate the rest stops at a reasonable distance from restrooms, a modular unit composed of an RV or composting toilet can be added to the layout in areas distant from restrooms.

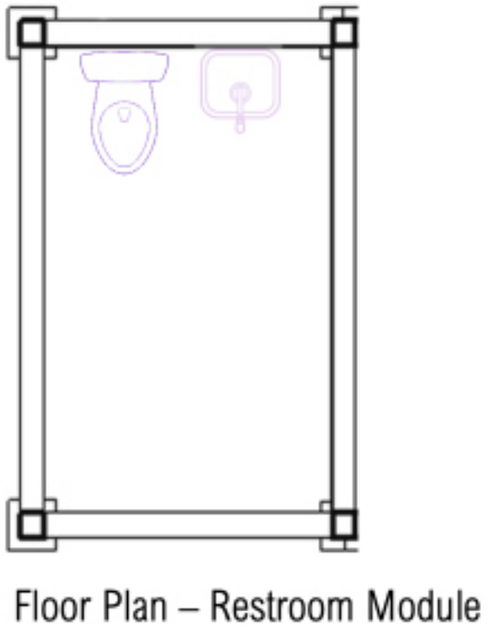


Figure 69 - Restroom module floor plan

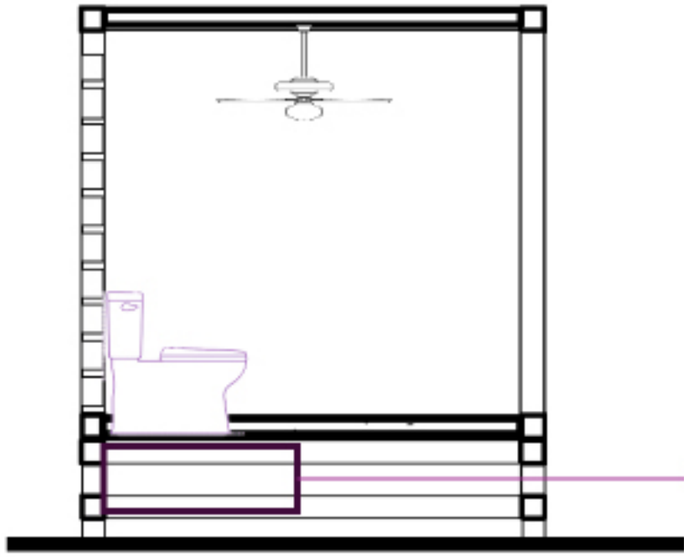
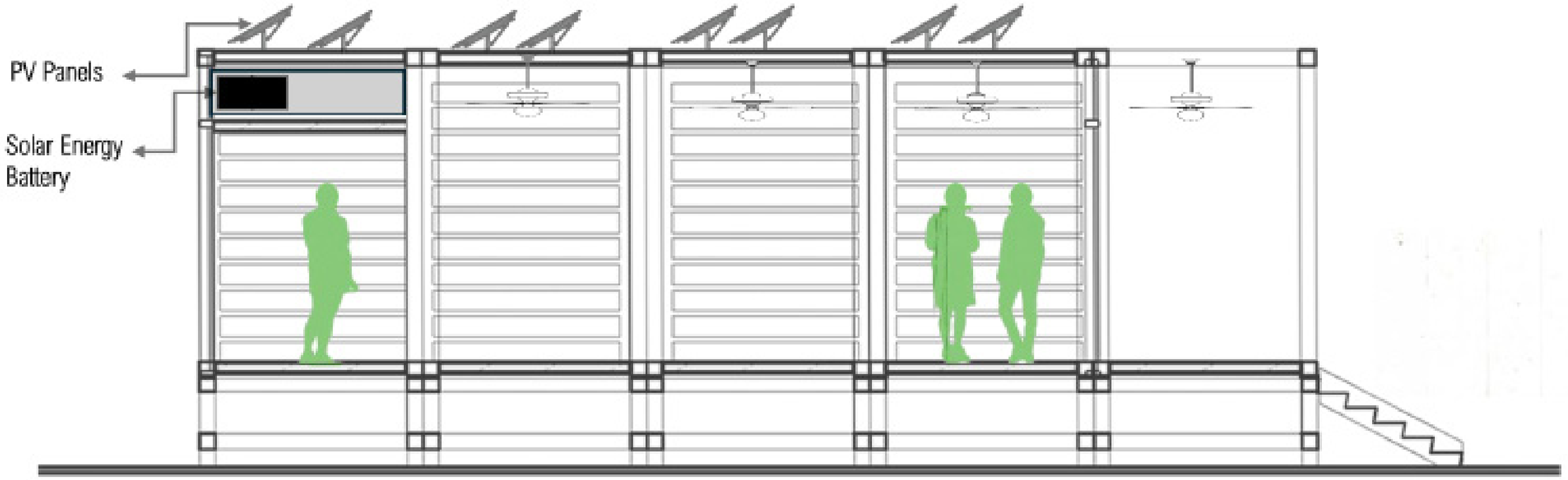
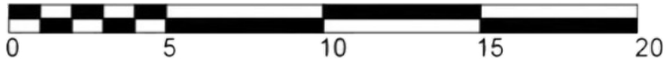


Figure 71 - Restroom module section

project proposal - energy source / photovoltaic panels



Section – PV Panels

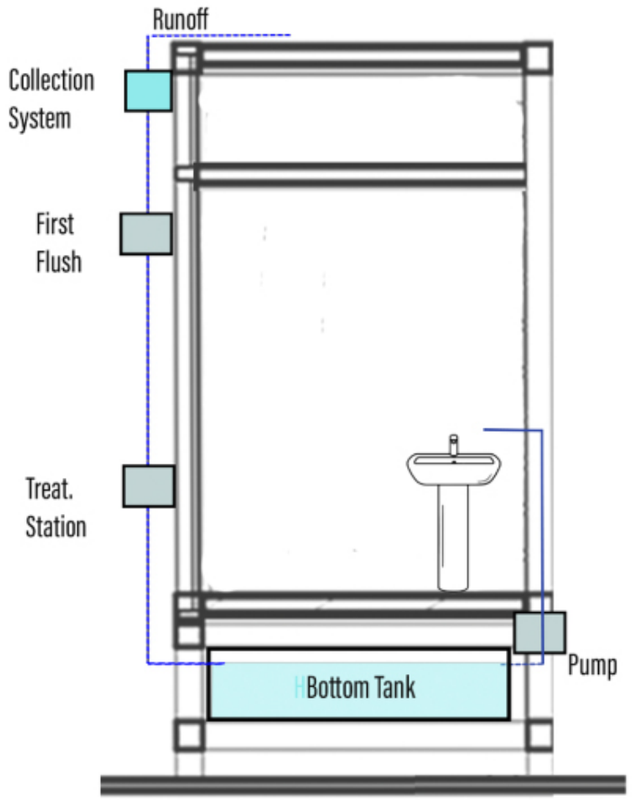


Solar energy panels for power source and indoor light are suitable for this project as the modules are likely to be placed in urban settings lacking electrical power infrastructure or needing greater effort to connect power, and also due to their ephemeral nature.

Figure 70 - Module section with PV Panels

project proposal - rainwater collection system

A rainwater collection system is adequate for this project to provide water for the rest stop, as the modules are likely to be placed in urban settings lacking plumbing infrastructure.



Section – Rainwater Collection System

Figure 71 - Restroom module section

project proposal - Location / Longer Stop (20+ min)

The second approach is to allocate the rest stops to squares or plazas that, although located in high-density areas, are currently underused due to the absence of public equipment or attractions to engage pedestrians. These areas would be adequate to allocate the modules, allowing a more flexible module layout and providing an opportunity to revitalize the space, increase social energy, and engagement between delivery drivers and locals.

Figure 72 - Largo da Batata Square

Figure 73 - Rosa Alves da Silva square

Figure 74 - Site locations in the map

Figure 75 - Por do Sol Square

project proposal - Location / Longer Stop (20+ min) Square/Plaza Approach

Largo da Batata, located in the neighborhood of Pinheiros, is used as an examble to better elucidate the application of the modules in the longer stop module approach.

Figure 77 - Largo da Batata square

Figure 76 - Largo da Batata square

Figure 78 - Pinheiros neighborhood located in the map

project proposal - Location / Longer Stop (20+ min) Square/Plaza Approach

The city of Sao Paulo played a significant role in Brazil's early development. Many places throughout the city have a considerable historical context, and one of them is Largo da Batata, which name in English means *Potato Square*. A series of historical events took place at Largo da Batata, from the foundation of the Pinheiros neighborhood in 1560, the settlement of indigenous people, and mainly for the trade of farming products in the twenties, primarily by Japanese immigrants who would sell large quantities of potatoes.

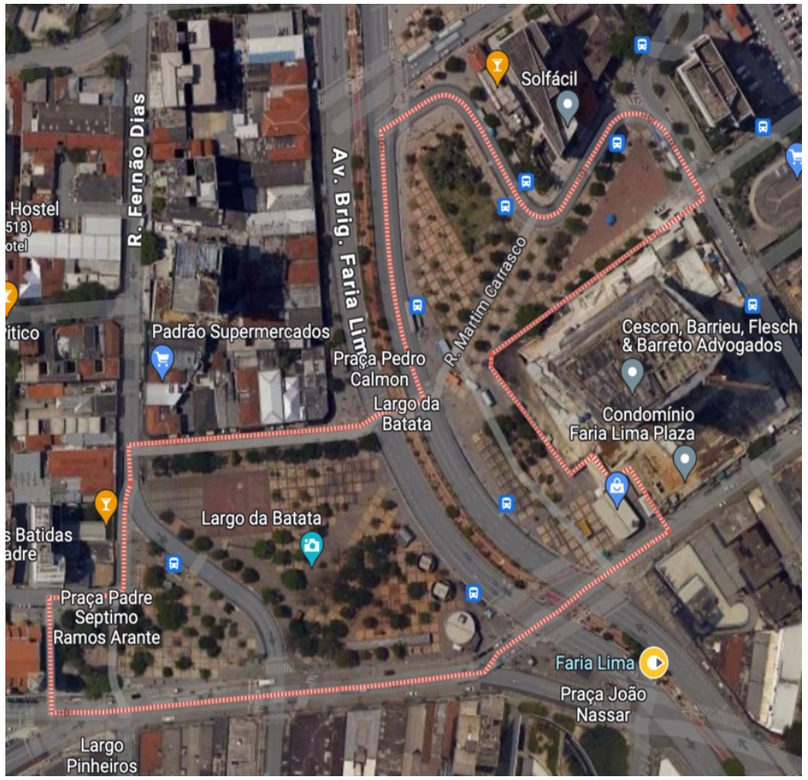


Figure 79 - Largo da Batata aerial view

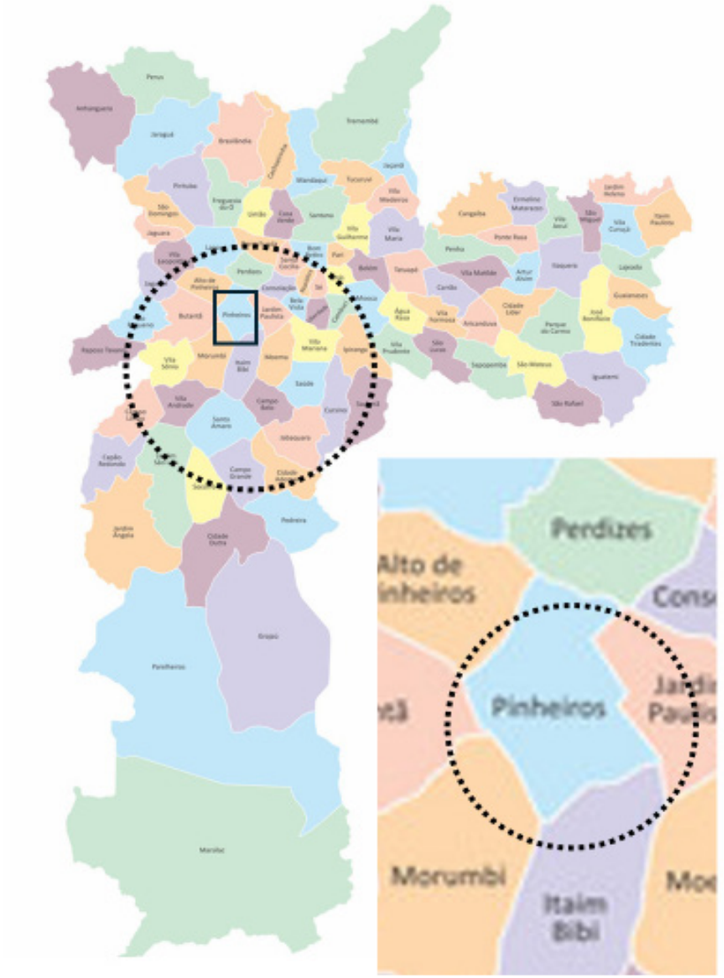


Figure 80 - Pinheiros neighborhood located in the map

Figure 81 - Largo da Batata historical image

Figure 82 -Largo da Batata historical image

project proposal - Location / Longer Stop (20+ min)

Square/Plaza Approach

Figure 83 - Largo do Batata existing site

Figure 84 - Largo do Batata proposed site

Proposed Site Plan

Figure 85 - Largo do Batata proposed site

The proposal for this type of area is to satisfy the drivers' needs by providing them with a bigger and calmer space and a dedicated area for their motorcycles, and to increase the usefulness of the park by providing an open area for community gatherings like farmer's markets, vintage and small business events, a stage for live music and performances, and an outdoor museum to contextualize the site's history along time. The delivery drivers then become a part of a larger system of inclusion, as their presence can be related to improvement, leisure, and learning for all city occupants.

Figure 86 - Modules rendering at Largo da Batata Square

Figure 87 - Modules rendering at Largo da Batata Square

project proposal - Location / Longer Stop (20+ min) Square/Plaza Approach

Figure 88 - Modules rendering at Largo da Batata Square

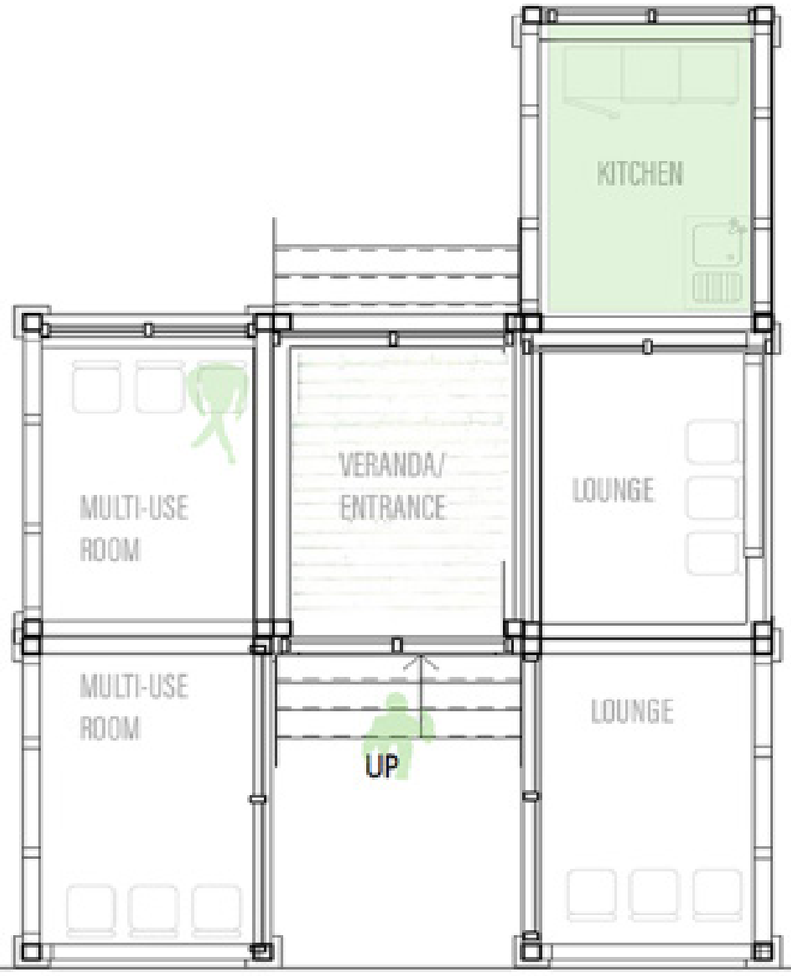


Figure 89 - Modules floor plan - Longer stop approach

Module 1
(L10'4" W 7' H 10')

Module 2
(L10'4" W 7' H 27")

Window Panels
Glass Panels
Solid Panels

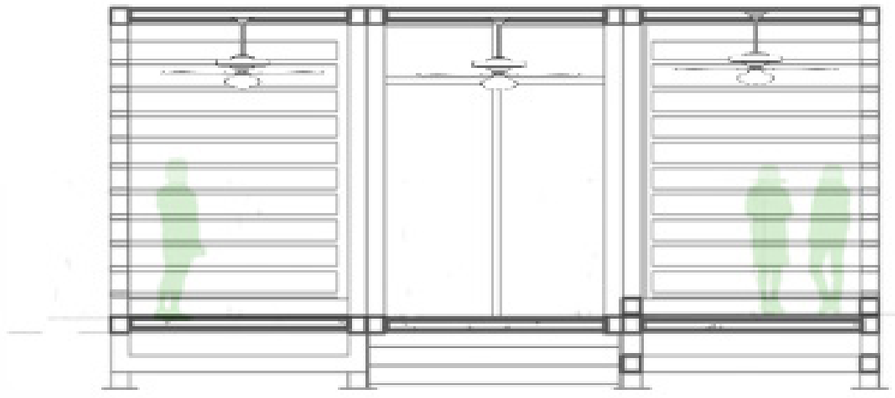


Figure 90 - Modules section - Longer stop approach

Figure 91 - Module interior rendering

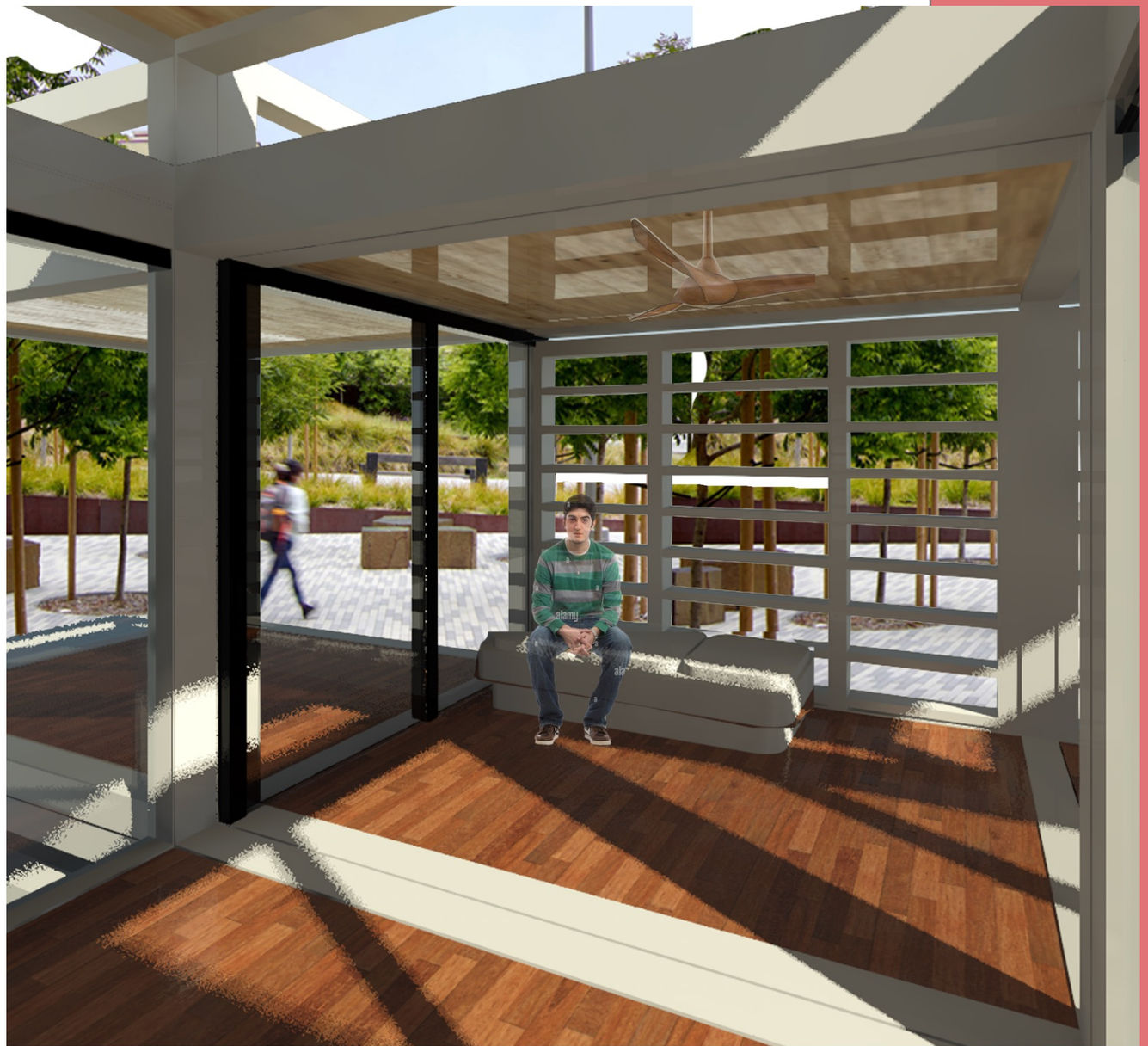


Figure 94 - Module interior rendering

conclusion

Pop-up architecture in the form of rest stops might be perceived as a temporary solution for delivery drivers in Sao Paulo. However, the social impact of a pop-up structure often reaches further than the structure itself as it promotes community engagement, democratizes the space, and fosters inclusion. In this case, it paves the way for more visibility and acceptance toward delivery drivers.

Pop-up architecture cannot fight inequality and spatial injustices alone, the roots of these pressing challenges go further than building temporary physical structures. However, pop-up architecture's adaptable, flexible, and dispatchable traits make it an ally toward more permanent and inclusive spatial solutions. Moreover, this form of architecture is preferable over traditional architecture in this context as it allows design freedom, rapid response, and community-focused solutions.

Finally, this research presents pop-up architecture as a temporary solution for delivery drivers' situation, indicating that architecture, through human-oriented practices, can be a transformative tool for addressing the spatial inequalities found in modern urbanization.

figures

All images not cited here are attributed to the author

Figure 1 – The Walking House by N55, Copenhagen, Denmark.
Source: https://paleotool.com/2010/08/07/n55-walkinghouse/

Figure 2 – Vertical Campsite for the Homeless by Studio Malka, France
Source: https://studiomalka.com/en/portfolio/a-kamp47-inhabit-the-wall-marseille-2013/

Figure 3 - Brugge Triennale's Liquid City Pavilion by Segascano Architecture.
Source: https://www.architecturaldigest.com/gallery/bruges-triennial-showcases-modern-design-within-historic-city

Figure 4 – Pop-up shop by Avoid Obvious Architects, NYC

https://aoarchitect.us/projects/mr-the-artist-popup/mrtheartist-popup-shop-avoidobvious-drawing_page_1/

Figure 5 – Plug-in City by Peter Cook
Source: https://www.moma.org/artists/6950#works

Figure 6 - Plug-in City by Peter Cook
Source: https://www.moma.org/artists/6950#works

Figure 7 - Plug-in City by Peter Cook
Source: https://www.moma.org/artists/6950#works

Figure 8 - 2015 Pavilion at the Serpentine Gallery, Kensington Gardens, London. By SelgasCano.
Source: https://www.archdaily.com/915801/selgascanos-serpentine-pavilion-to-be-relocated-to-ice-age-excavation-site-in-los-angeles

Figure 9 - The Maidan Tent, designed by architects Bonaventura Visconti and Leo Bentini. Ritsona Refugee Camp, Greece.
Source: https://www.archdaily.com/905769/the-first-maidan-tent-is-built-to-aid-refugees-in-greece/5beae-91208a5e50e3f000135-the-first-maidan-tent-is-built-to-aid-refugees-in-greece-photo?next_project=no

Figure 10 - The Maidan Tent, designed by architects Bonaventura Visconti and Leo Bentini. Ritsona Refugee Camp, Greece.
Source: https://www.archdaily.com/905769/the-first-maidan-tent-is-built-to-aid-refugees-in-greece/5beae-91208a5e50e3f000135-the-first-maidan-tent-is-built-to-aid-refugees-in-greece-photo?next_project=no

Figure 11 - The Maidan Tent, designed by architects Bonaventura Visconti and Leo Bentini. Ritsona Refugee Camp, Greece.
Source: https://www.archdaily.com/905769/the-first-maidan-tent-is-built-to-aid-refugees-in-greece/5beae-91208a5e50e3f000135-the-first-maidan-tent-is-built-to-aid-refugees-in-greece-photo?next_project=no
Figure 12 – Delivery Driver
Source: https://rio.temporadacopacabana.com.br/10-restaurantes-copacabana-baratos-delivery/

Figure 13 – Right to the City Illustration
Source: https://culturehouse.medium.com/spatial-justice-and-the-right-to-the-city-55b8dcc4e5b5

Figure 14 – Delivery Driver Resting at Parking Garage
Source: https://restofworld.org/2023/delivery-drivers-subcontractors-brazil/

Figure 15 – Delivery Drivers Resting at Public Square

Source: https://www.metropoles.com/distrito-federal/video-taxistas-destroem-bancos-em-ponto-e-surpreendem-motoboys

Figure 16 – Delivery Drivers at Sidewalk
Source: https://peoplesdispatch.org/2020/07/02/app-delivery-drivers-mobilized-across-brazil-to-demand-better-work-conditions/

Figure 17 – White Brazilian Women Whips Black Delivery Driver
Source: https://thehub.news/white-brazilian-woman-whips-black-delivery-driver-in-a-public-display-of-racism/

Figure 18 – Biggest Economies in the World
Source: https://www.researchgate.net/figure/The-biggest-economies-in-the-world_fig1_343761483

Figure 19 – Income Distribution Inequality based on Gini Coefficient
in Latin America, by Country
Source: https://www.statista.com/statistics/980285/income-distribution-gini-coefficient-latin-america-caribbean-country/#:~:text=Gini%20coefficient%20income%20distribution%20inequality%20in%20Latin%20America%202022%2C%20by%20country&text=Based%20on%20the%20degree%20of,Gini%20coefficient%20amounted%20to%2052.9.

Figure 20 – Brazil's Wealth Distribution, 2021
Source: https://www.statista.com/statistics/1294715/distribution-wealth-by-percentile-brazil/#:~:text=In%20Brazil%2C%20from%20the%20total,had%20more%20debts%20than%20assets.

Figure 21 – Stayed Bridge in Sao Paulo
Source: https://www.rapyd.net/blog/brazil-ecommerce-explorer-people-and-payments-guide/

Figure 22 – Museum of Art of Sao Paulo - MASP
Source: https://en.wikipedia.org/wiki/Tourism_in_the_city_of_S%C3%A3o_Paulo

Figure 23 – Map of Brazil
Source: https://www.mapsofworld.com/brazil/state/rondonia/location-map.html

Figure 24 – Faria Lima Avenue, Sao Paulo
Source: https://stock.adobe.com/search?k=cruzamento

Figure 25 – Areal view of Sao Paulo
Source: Google maps

Figure 26 – Map of Income Concentration and Job Accessibility
Source: https://periferiaemmovimento.com.br/mapaacessosp/

Figure 27 – Delivery Drivers at Sidewalk in Sao Paulo
Source: https://diariodegoias.com.br/stf-inicia-debate-de-alcance-de-decisao-sobre-vinculo-trabalhista-entre-motoristas-e-aplicativos/413427/

Figure 28 – Module Transportation
Source: https://www.panelbuilt.com/index.php/blog/becoming-a-modular-construction-dealer

Figure 29 - Ikea's Better Shelter for Refugees
Source: https://www.fastcompany.com/90181191/watch-ikeas-ingenious-flat-pack-shelter-go-up-in-just-4-hours-2

Figure 30 - Brugge Triennale's Liquid City Pavilion by Segascano Architecture
Source: Source: https://www.architecturaldigest.com/gallery/bruges-triennial-showcases-modern-design-within-historic-city

figures

figures

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