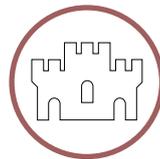




with HERITAGE to SUSTAINABILITY

Mouraria's identity and well-being of its community is currently at stake. Due to many factors like urbanization, tourism, changes in demography and climate change, the neighbourhood is tackling many challenges. However its great social capital and material and immaterial heritage are a great opportunity to transform it into a green and thriving neighbourhood.

Our VISION is to transform the historic urban tissue of Mouraria into a resilient neighbourhood, in which design solutions are inspired by the local heritage and give clear direction for its community to thrive and adapt towards the ongoing and future challenges, serving as a base for sustainable development.



working with existing structures, respecting the historic heritage



enhancing culture and engaging local communities



nature-based solutions to mitigate climate change impacts



creating a complete neighbourhood that fosters more sustainable lifestyle

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KEY DESIGN PRINCIPLES

In order to address the main objectives in the best possible way, it was crucial to first familiarize oneself with the existing prerequisites in terms of social, economic, physical and environmental characteristics of Mouraria. To do so, the **analysis of provided documentation** was enriched with a **field study of the site**, that resulted in recognizing strong social capital of the area and potential areas of intervention (enclosed brownfields, streetscapes) that serve as an opportunity for improving the neighbourhood.

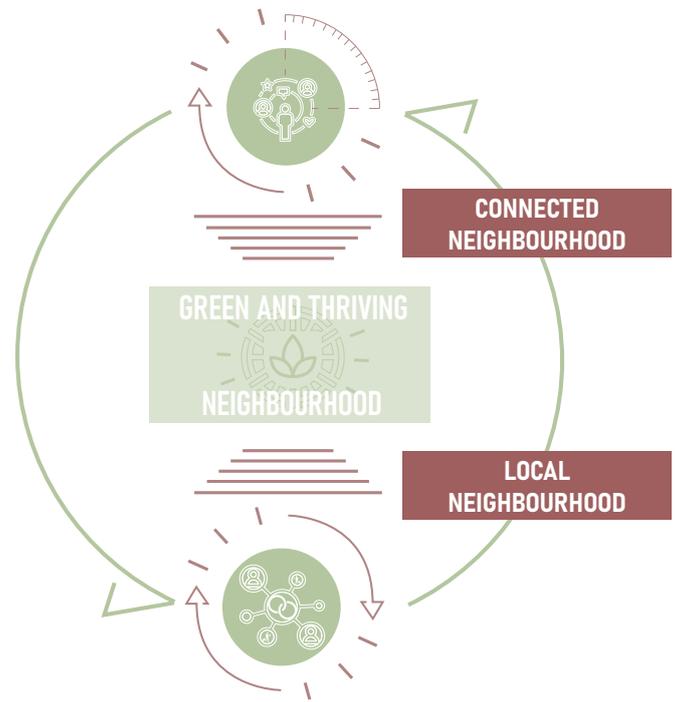
During the design process, special attention was paid to the three missions for regenerating Colina do Castelo listed by the HUB-IN **to create a circular neighbourhood while preserving and enhancing immaterial and material heritage of the area**. Also, municipal goals from the PAC LISBOA 2030 (Action Plan for Lisbon 2030), were taken into consideration - especially in regards to the land management, water management, green infrastructure and local production of renewable energy. In addition, the project complies with the framework outlined in the document MOVE Lisboa - Strategic Vision for Mobility 2030 and explores the design solutions to facilitate **more sustainable and uniform network of public transport in the area and beyond**. Moreover, the Lisboa Cidade Solar project objectives played a significant role to provide the most relevant solutions for Mouraria in terms of **green energy**.

The strategies and design solutions for Mouraria were ultimately formulated in accordance with the **15-minute city** urban model, aiming to foster the establishment of a green and thriving neighborhood serving the needs of local communities. This endeavor was guided by ten Design Principles elucidated in C40 and ARUP's Guidance to Design a Green and Thriving Neighbourhood, which are outlined below.

Nonetheless it is the people of Mouraria that stand as the main driver for the project and play the main role in transforming the neighbourhood. For this reason, the design solutions are based on **traditional knowledge, local initiatives and cultural heritage** that serve as a foundation for more bottom-up and sustainable development.

OVERVIEW OF THE STRATEGIES

A comprehensive action plan presented throughout next chapters encompasses two main strategies to achieve the outlined vision.



CONNECTED NEIGHBOURHOOD

Adapting 15-min city principles to foster soft mobility and enhance accessibility

A

Adapted principles of the 15-min city urban model, with the emphasis on the local context, enable a transformational instead of a creational approach. They connect to the originally intended system of a medieval urban structure (walkability, exchange & trade system) and have been proven in terms of sustainable development.

LOCAL NEIGHBOURHOOD

Enhancing local communities in symbiosis with tourism

B

The symbiosis between the locals and the tourists reflects a clear hierarchy between the public and the local spaces. In addition, the network of new catalysts supports shared and circular economy, as well as provide new job opportunities. The new housing typologies accommodate the local needs and is affordable. The local heritage serves as the base for transformational adaptation of the urban scape.

10 DESIGN PRINCIPLES



1
COMPLETE NEIGHBOURHOODS



3
CLEAN CONSTRUCTION



5
SUSTAINABLE LIVING



7
A PLACE FOR EVERYONE



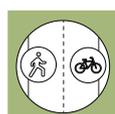
9
GREEN SPACES, URBAN NATURE AND CLIMATE RESILIENCE



2
SMART AND CONNECTED PLACES



4
CIRCULAR RESOURCES



6
PEOPLE-CENTRED STREETS AND LOW-CARBON MOBILITY

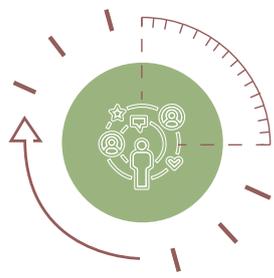


8
GREEN ENERGY AND BUILDINGS



10
GREEN ECONOMY

with HERITAGE to SUSTAINABILITY



A CONNECTED NEIGHBOURHOOD

The 15 - minutes city model is an established urban model in today's society and has proven itself in terms of sustainable development. By ensuring convenient access to daily amenities as well as services and promoting the use of low- to zero-emission modes of transportation, the quality of life within a neighborhood enhances through the reduction of air pollution and the equitable accessibility of diverse functions.

Mouraria has a great potential of becoming a connected neighbourhood - having its origins in the Middle Ages its urban structure was built in human-scale and to be walkable. Also, a thorough GIS analysis of the site has revealed that there is an already established network of services and amenities available within the neighbourhood or in a close proximity. However in the specific context of Mouraria, the missing element to become a complete neighbourhood lies in the hindered accessibility to the day-to-day functions. The site being situated on the foothill of the São Jorge, consists of many internal connections in a shape of narrow and steep streets or long staircases that make the perceived distances traversed within the area much more challenging than ones situated on a flat plateau. The problem is even more relevant considering the demography of Mouraria's population that consists of significant number of people aged 65 and over. In addition, already limited space on the streets is often overtaken by the car traffic, influencing the increased air and noise pollution, hampering safety for pedestrians and impeding maintenance of the area (e.g. waste management).

This means that for flat stretches of the site, a greater radius of movement in a certain time is more feasible compared to when one has to walk uphill or downhill over staircases. Therefore a **key action** to improve accessibility is to strengthen north-south oriented connections that are levelled and easy to move along. The reclamation of the parking spots and reorganization of the traffic will provide new room for pedestrian oriented solutions whose ultimate goal is to make commuting to existing public transportation nodes in the surroundings (tram/bus/metro stops/city bike rentals) easier and safer. Proposed design solutions align with the mobility strategy for Lisbon (MOVE Lisboa) through supporting five networks (Interfaces, Road, Pedestrian, Cycle, Public Transport) and five services (Shared Services, Parking, Urban Logistics, Additional Mobility, Tourist Transport) mentioned in the document.

The following chapter explains specific actions and design solutions regarding the described strategy and provides an overview of specific locations for certain implementations.

OPPORTUNITIES

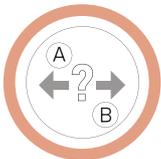


historic urban structure built in human-scale - structure to accommodate the 15-min city urban model

CHALLENGES



accessibility issues regarding users with reduced mobility



existing functions around the area, however not accessible



car traffic overtaking the streets

DESIGN PRINCIPLES

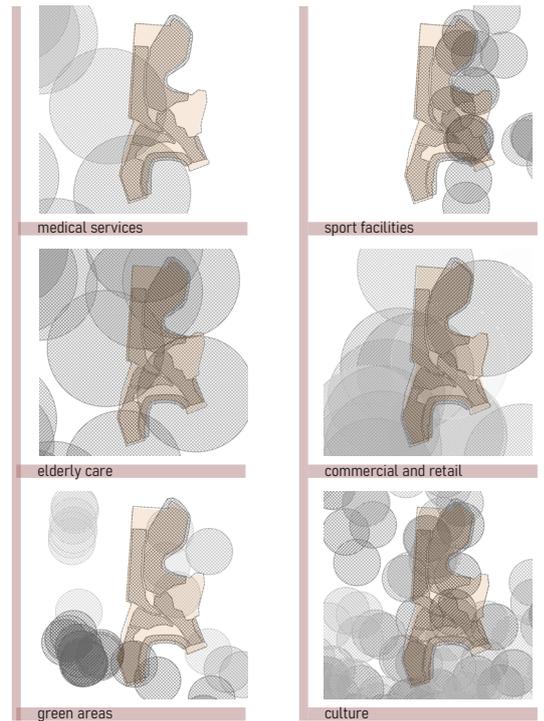
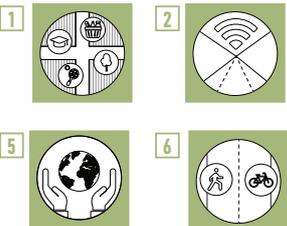


Fig. 1 | GIS analysis of the distribution of six basic types of services and amenities within Mouraria and its surroundings. Depending on a certain function, the radius is set between 200 and 500 meters.

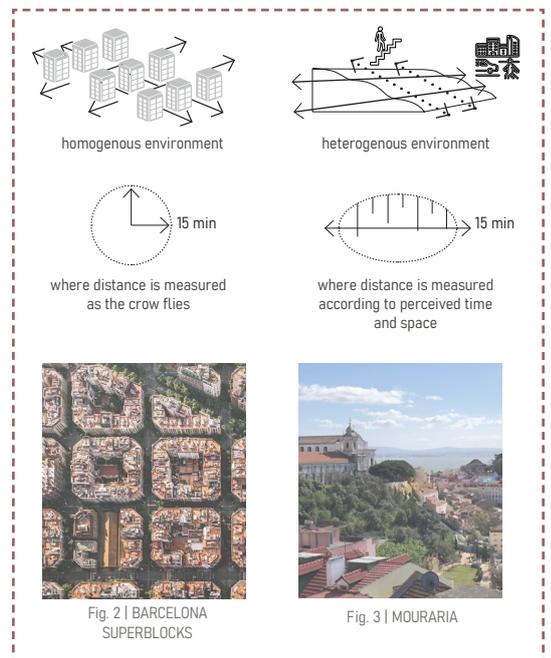
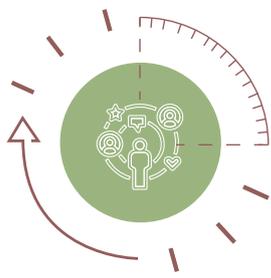


Fig. 2 | BARCELONA SUPERBLOCKS

Fig. 3 | MOURARIA



Fig. 4 | FIVE NETWORKS OF TRANSPORT LISTED IN THE STRATEGIC VISION FOR MOBILITY

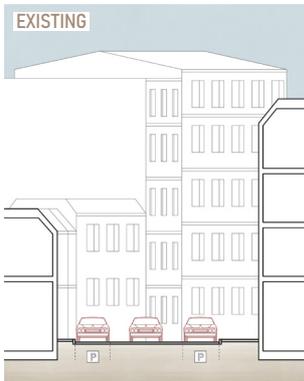
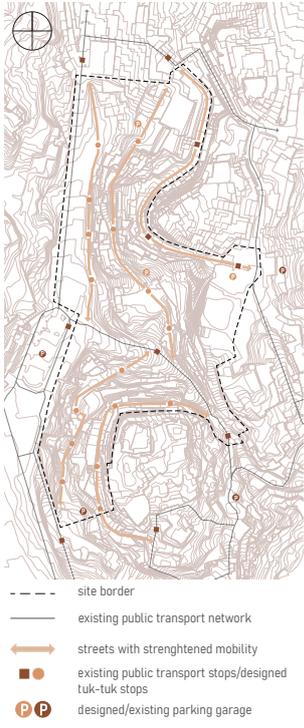


with HERITAGE to SUSTAINABILITY

A CONNECTED NEIGHBOURHOOD

RECLAIMING PARKING SPOTS

The streets in Mouraria are in majority overtaken by motor vehicles, leaving little or no space for people. On the other hand, they stand as main links to the existing public transport network, which connects the area with all needed services and amenities around. Hence **strengthening soft mobility** along them can substitute for the prevailing car traffic. To **enhance pedestrian and bike mobility**, space dedicated for parking spots is partially reclaimed and repurposed to provide new infrastructure. Allocation of new street equipment is based on recognised active groundfloor use and main pedestrian flows, so that specific parking spots can be transformed based on **context- and user-specific needs**. In cooperation with local businesses owners, a space once occupied by a car can become a parklet to extend a restaurant's offer or to provide seating for elderly on their way home from a grocery store. Additionally, some of the newly available spaces are designed to provide bicycle parking facilities and basic repair tools, while several are allocated to accommodate street vegetation, thereby offering shade and contributing to improved microclimate, particularly on hot days.



Furthermore, the reclamation of parking spots serves to **improve the waste management system**. Providing spaces for a network of underground waste bins along the main connecting streets enhances the collection from smaller neighbourhood bins within the area. Engaging people from the local community to convey waste from smaller bins to the collective points can be an incentive for creating new job opportunities for local residents and would improve the general citywide waste management system.

Repurposing parking spots in Mouraria serves not only the improvement of soft mobility and connectivity to day-to-day services, but also leads to **a significant reduction of emissions** that is further facilitated by new street vegetation. The combination with the street furniture placed in a co-creational way with the local community improves the overall quality of public spaces and the **possibility for more social activities** of Mouraria's community. Furthermore, the project of reclaiming parking spots is a stepping stone towards creating a 100% car-free zone in the future.

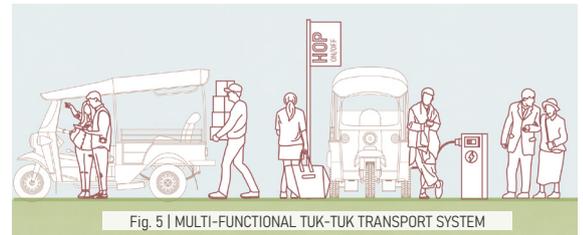


STREET TRANSFORMATION ON EXAMPLE OF THE INTERSECTION OF ESCADAS DO MONTE AND R. DAMASCENO MONTEIRO

enhancing local restaurant by providing space for parklets, creating safer space for pedestrians around the bus stop and adding bike racks for soft mobility, and vegetation and water feature to improve microclimate

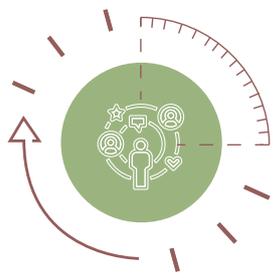
TUK-TUK AS LOCAL PUBLIC TRANSPORT

Lisbon is nowadays one of the main tourist destinations attracting millions of visitors every year. Mouraria became one of the highlights to discover during the visit in the Portuguese capital. To facilitate tourists' excursions throughout steep landscape of the neighbourhood, guided tuk-tuk trips became popular. As a result, Mouraria's streets are now filled with auto rickshaws that influence overcrowding of the public spaces and serve mainly the tourists' liking. On the other hand, this service is provided by the businesses that employ local population. Therefore it is proposed to shift the emphasis in regards to the target group of tuk-tuk services, which serves as a **base for a sustainable public transport system**.



This project tremendously improves the mobility within the area, especially **in regards to the aging population** of Mouraria and **people with reduced mobility** in general. Additionally, it outlines the limited dimensions of the streets that often cannot accommodate e.g. a passenger bus traffic and will also compensate for the reduced accessibility to the tram service mentioned by the local stakeholders. Furthermore, the transport service will be combined with **a last-mile delivery services** to reduce delivery traffic and provide **new local jobs**. Putting focus on using a tuk-tuk fleet that is powered with solar energy harvested locally contributes to a circular economy in the area.

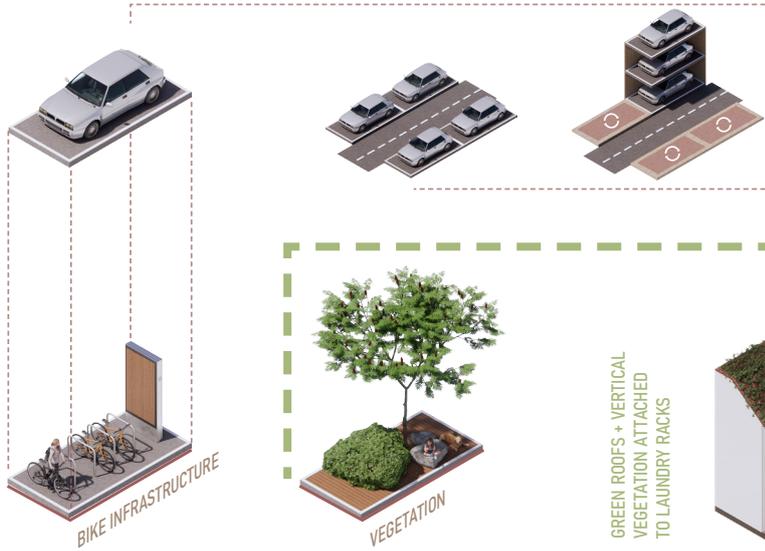
The project would be based on a co-operation between municipal organs and private companies offering auto rickshaw services. The system is designed on a hop-on/hop-off principle and in the first phase requires only low-cost equipment to mark the stops for the vehicles. The proposed network is outlined on the page 6. In addition, the service should be first and foremost oriented towards the local population by offering a discount on tickets for ones having a permanent address in Lisbon.



with HERITAGE to SUSTAINABILITY

A CONNECTED NEIGHBOURHOOD

WHAT



accumulation of parking spots in the new and designed parking garages within the neighbourhood provides room for design solutions improving quality of streets

WHERE

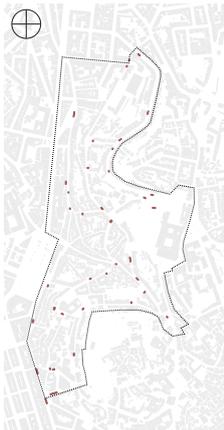


FIG. 7 | LOCATION OF NEW BIKE INFRASTRUCTURE



FIG. 8 | LOCATION OF NEW STREET VEGETATION

REFERENCES



FIG. 9 | SAN FRANCISCO - mural bike parking replacing the car parking spots



FIG. 10 | WROCŁAW - replacing parking spots with street vegetation

BENEFITS

- + improved water management
- + using existing resources for new design
- + emissions reduction
- + better microclimate on streets
- + improved quality of public spaces
- + facilitating needs of the aging population



GREEN ROOFS + VERTICAL VEGETATION ATTACHED TO LAUNDRY RACKS

BIOSWALES

Because of the dense structure of Mouraria that leaves little space for horizontal vegetation, **vertical greenery** solutions are implemented. **Green roofs** are applied mainly to the new structures, whereas in case of existing structures, the omnipresent **laundry racks** on the buildings' facades are used to set up a **vertical structure for climbing plants**.

In cases where the streetscapes allows for implementations of **horizontal greenery**, they are enriched with **bioswales** that improve water management in the area by water run-off catchment and its infiltration. In addition, plants with **high evapotranspiration level** are beneficial for the microclimate and **mitigate UHI effect**, hence also enhancing soft mobility.

VERTICAL GREENERY AND ART ON WALLS

RAILING VEGETATION + VEGETATION PATCHES ON STAIRCASES

Currently the abundance of high retention walls within Mouraria hold opportunity for additional **vertical greenery** solutions that can be combined with the hydroponics system to grow vegetables. The vegetation is merged with space dedicated to local artists to **use art as a mean to raise climate awareness** and to highlight Mouraria's identity.

A plethora of staircases within Mouraria holds the opportunity to embed additional greenery in the area - opening up the sealed surfaces along the **railings** and within chosen segments of the **staircases** provide room for **new plantings**. Moreover, with benches embedded in the planters' structures, they provide comfortable **seating areas to improve mobility** within the elderly group of the residents.

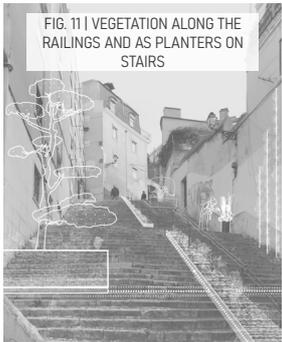


FIG. 11 | VEGETATION ALONG THE RAILINGS AND AS PLANTERS ON STAIRS

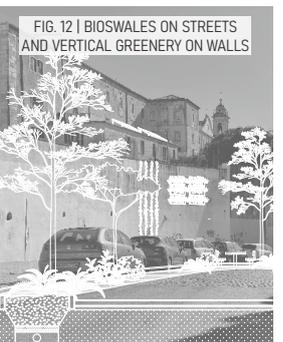
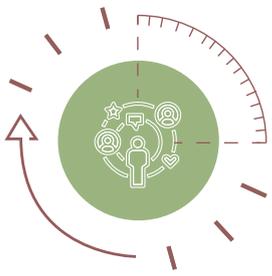


FIG. 12 | BIOSWALES ON STREETS AND VERTICAL GREENERY ON WALLS

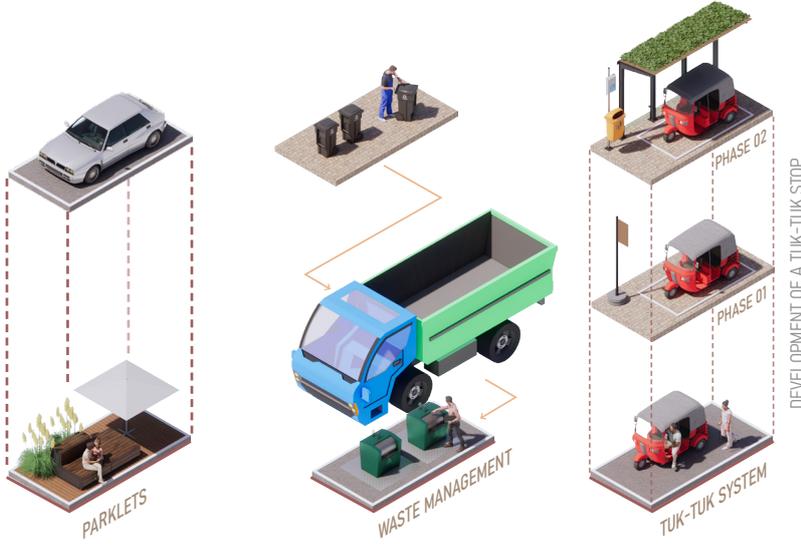


with HERITAGE to SUSTAINABILITY

A CONNECTED NEIGHBOURHOOD

Below is presented a map with potential tuk-tuk system network of hop-on/hop-off stops. In the first phase it encompasses the Mouraria neighbourhood, however, based on its evaluation after a test run, it could be easily applied in the adjacent neighbourhoods, e.g. Alfama, Graça.

WHAT



WHERE

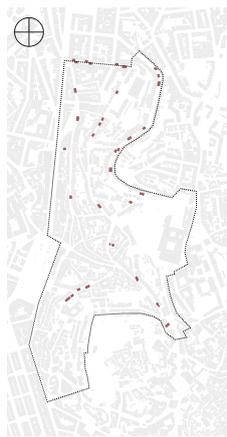


FIG. 13 | LOCATION OF NEW PARKLET INSTALLATIONS



FIG. 14 | LOCATION OF COLLECTIVE WASTE BINS

REFERENCES



Fig. 15 | CORK - program to replace parking spots with parklets



Fig. 16 | LISBON - underground waste bins

BENEFITS

- + emissions reduction
- + new jobs for local residents
- + strengthened public transport network with a focus on local residents
- + circular neighbourhood
- + improved accessibility to day-to-day services and amenities
- + improved waste management

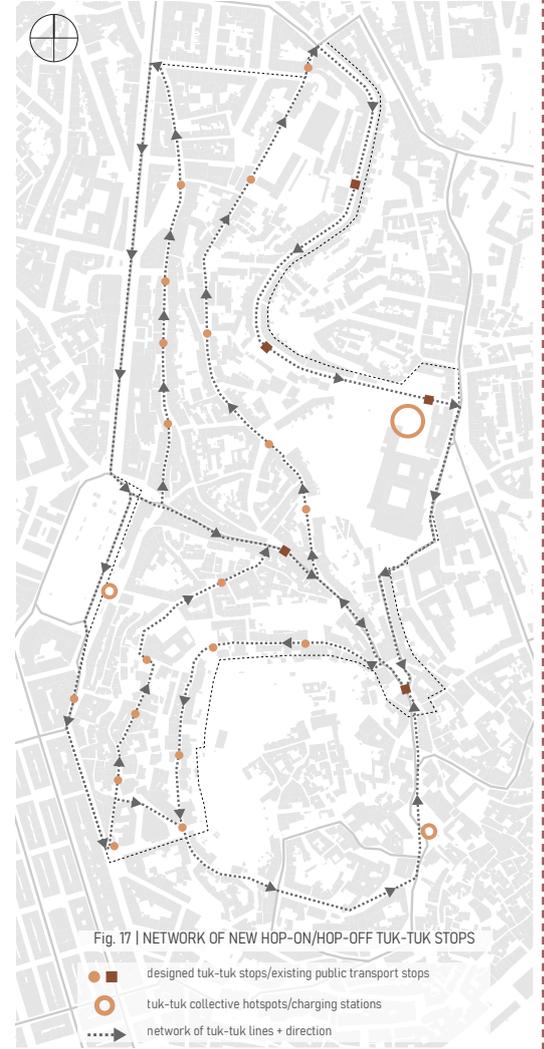
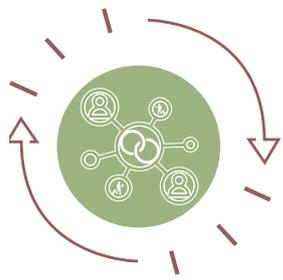


Fig. 17 | NETWORK OF NEW HOP-ON/HOP-OFF TUK-TUK STOPS

- designed tuk-tuk stops/existing public transport stops
- tuk-tuk collective hotspots/charging stations
- network of tuk-tuk lines + direction



NEW PUBLIC SPACE DESIGN ON R. DO BENFARMOSO



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B LOCAL NEIGHBOURHOOD

A green and thriving neighbourhood apart from offering all day-to-day services and amenities should provide qualities that improve local community's well-being and provide a foundation for a more socially and economically sustainable area.

As already mentioned, Mouraria is currently facing some challenges linked to the touristification of the neighbourhood. Economic dependency on tourism led to gradual desertification of the area followed by the replacement of local businesses with tourist-oriented retail, depletion of housing stock for the benefit of short-term rental accomodation and neglect of public spaces. The disparity between the local communities and external visitors has negatively influenced the quality of life within the neighbourhood, which is proved by the series of interviews and participative projects carried out among Mouraria's residents.

Nevertheless, the neighbourhood is known for its close-knit community with diverse cultures from many different nationalities. **The dormant potential of local traditions, art and innovation can serve as a foundation to co-create new catalysts.** The field study led to recognition of areas with neglected and abandoned buildings, underutilized public spaces as well as enclosed, fenced-off brownfields that were chosen to serve as places of setting up the aforementioned catalysts [presented on a diagram to the right]. The program of those is designed to facilitate specific needs of perceived communities within Mouraria that were outlined based on the field study and demographic analysis. The inherent qualities of those communities and their material and immaterial heritage [gathered in identity collages presented to the right] served as a backbone in the design process.

Ten new catalysts, in combination with the strenghtened main connecting streets and improved local connections, ultimately result in a **more uniform network of social hotspots** with a clear hierarchy of what is private, semi-private, semi-public, and public. Local residents gain **additional space for social interaction** outside of overcrowded tourist spots, new typologies of **affordable housing, additional workplaces** and workshops for local businesses and **intergenerational/intercultural venues** to facilitate community strenghtening. All of the aforementioned design interventions are developed in accordance with green and circular solutions, while also adhering to planning rules and guidelines. These interventions establish the necessary framework **to promote a more sustainable lifestyle within Mouraria.** The key design solutions for these transformative catalysts are presented and described in greater detail on the next pages.

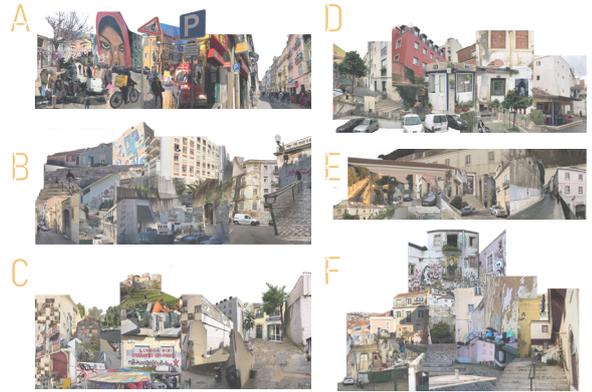


Fig. 18 | Identity of perceived neighbourhoods

OPPORTUNITIES



diverse, multicultural community, bottom-up initiatives and flourishing street art scene

CHALLENGES



local culture and urbscape commodified for the benefit of tourists



enclosed, underutilized or abandoned green areas



neglected buildings and public spaces

DESIGN PRINCIPLES

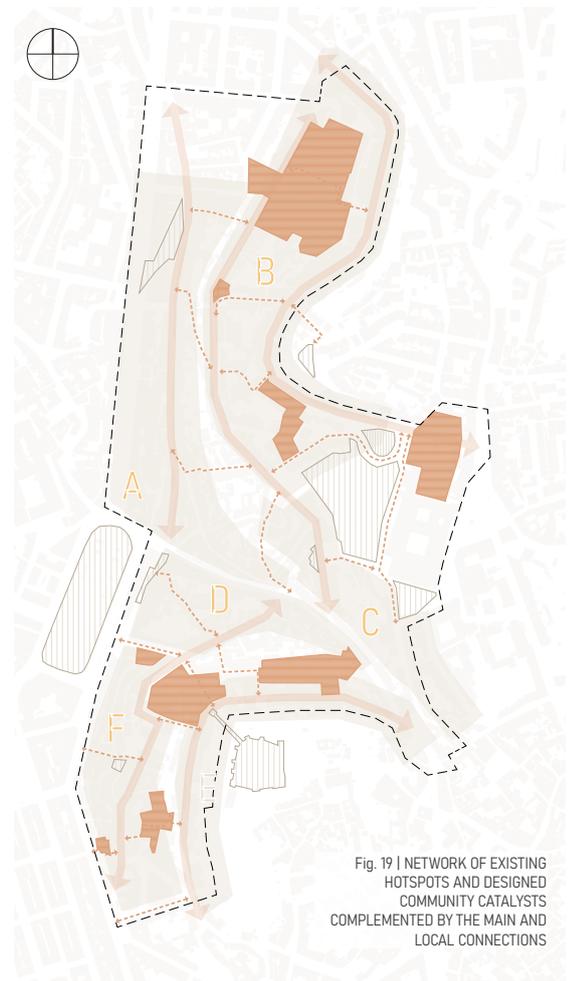
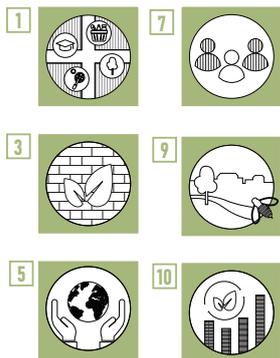
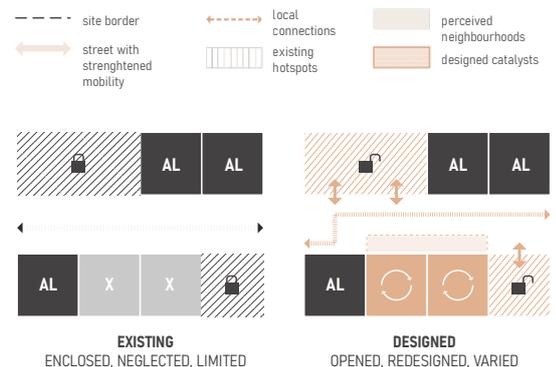
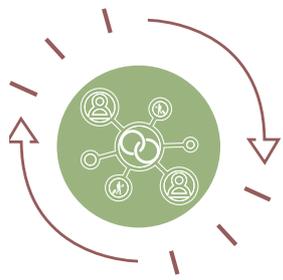


Fig. 19 | NETWORK OF EXISTING HOTSPOTS AND DESIGNED COMMUNITY CATALYSTS COMPLEMENTED BY THE MAIN AND LOCAL CONNECTIONS

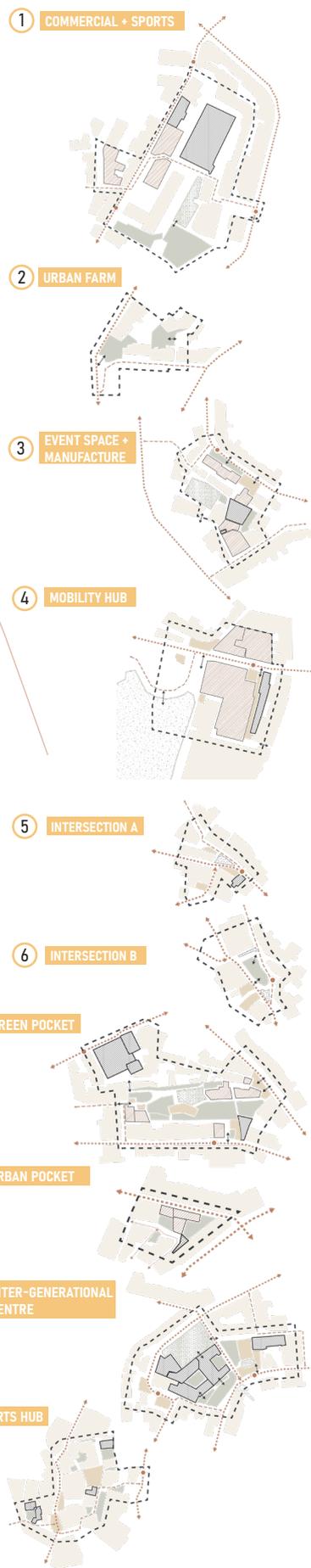




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B LOCAL NEIGHBOURHOOD

NETWORK OF DESIGNED COMMUNITY CATALYSTS



Presented network of spaces complements the neighbourhood with **new functions and reinvented public spaces**. The design is characterized by overarching principles described below.

INTRODUCING 3rd NATURE TO THE NEIGHBOURHOOD

Currently enclosed brownfields are in majority covered in lush greenery. Opening up those will contribute to **more uniform green and blue network** in Mouraria, but also provide more green recreational areas for the residents. In addition, new greenery, based on indigenous species, will contribute to cleaner air and will help **mitigate the Urban Heat Island effect** by increased evapotranspiration.

FIRST TRANSFORM THEN CREATE

New places are designed in a manner to **re-use and adapt the existing building stock**. Renovating existing instead of building new, re-using construction materials from the transformed streets and **using local materials** significantly reduces emissions, preserves material heritage of the area and contributes to more circular neighbourhood.

RE-ACTIVATING WATER FEATURES

To improve **water management** in the neighbourhood, existing water features (fountains, water spigots) are located and re-activated. Together with new, complementary water elements, which connect to a circular system, they provide drinking water and water for non-potable uses (e.g. cleaning the streets). Additionally they serve as cooling features in public places that **reduce the impact of heatwaves**.

INCLUSIVE DESIGN

New places include **age-friendly solutions** and are developed through a participatory involvement of the local community. Workshops, roundtables and engagement events as well as co-governance structures (combining municipal and local stakeholders and key actors) will be an important step in first setting out meanwhile use functions to gradually build a space that accommodates all of the key actors' needs. In addition, new **affordable housing** will result in a more diverse offer of housing typologies, balancing out the short-term rental stock.

COMMUNITY BUILDING & SUSTAINABLE LIFESTYLE

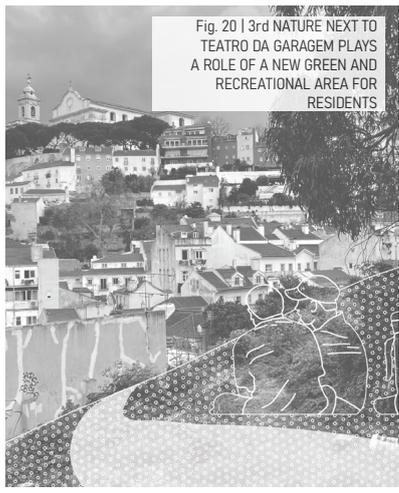
New functions support **intergenerational and multicultural** venues for the community to connect and thrive. Providing spaces for social interaction will facilitate exchange of knowledge and skills. Combined with support from local organizations and the municipality they will serve as an incubator for innovation and sustainable development, while cherishing local culture and heritage. In addition, new functions are designed to comply with a **shared and circular economy** to foster sustainable lifestyle choices.

GREEN AND LOCAL ECONOMY

New workplaces and workshops are designed to **accommodate first and foremost local actors and their businesses**. Therefore these spaces will be rented out based on an application process that will be carried out by the local co-governance structures. Businesses linked to developing and sharing local skills and knowledge will be prioritised.

RESILIENT NEIGHBOURHOOD

New places are designed to strengthen neighbourhood's resiliency towards future climate challenges. Water run-off **infiltration and rainwater harvesting** will improve water management; incorporating **solar panels** in new and renovated buildings will alleviate energy poverty and reduce GHG emissions; **new vegetation** will mitigate UHI island effect as well as improve biodiversity; and **urban farming** will serve as a local and healthy food source for residents.

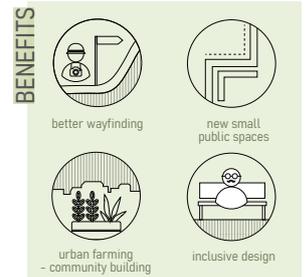
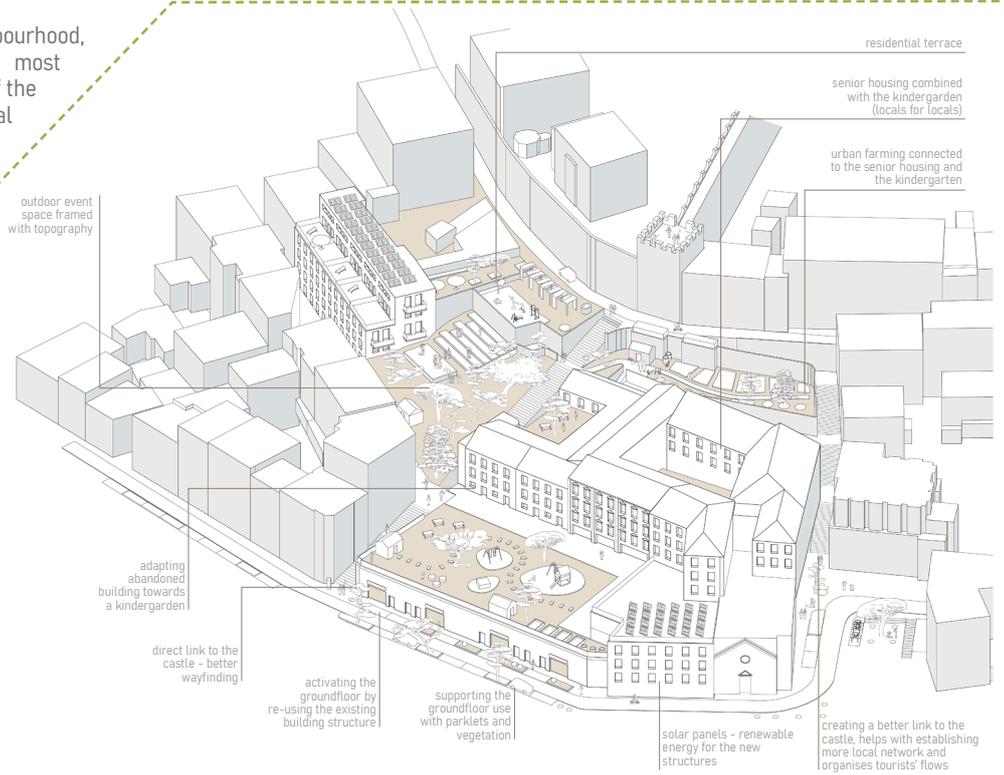


with HERITAGE to SUSTAINABILITY

Out of the network of new catalysts for the neighbourhood, four of them are selected to represent the most important qualities and characteristic features of the key actions. These include an intergenerational centre, event space + manufacture, a green pocket and a mobility hub.

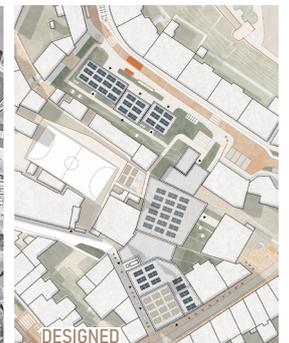
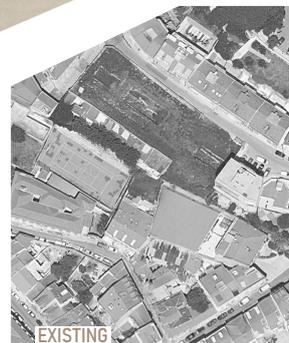
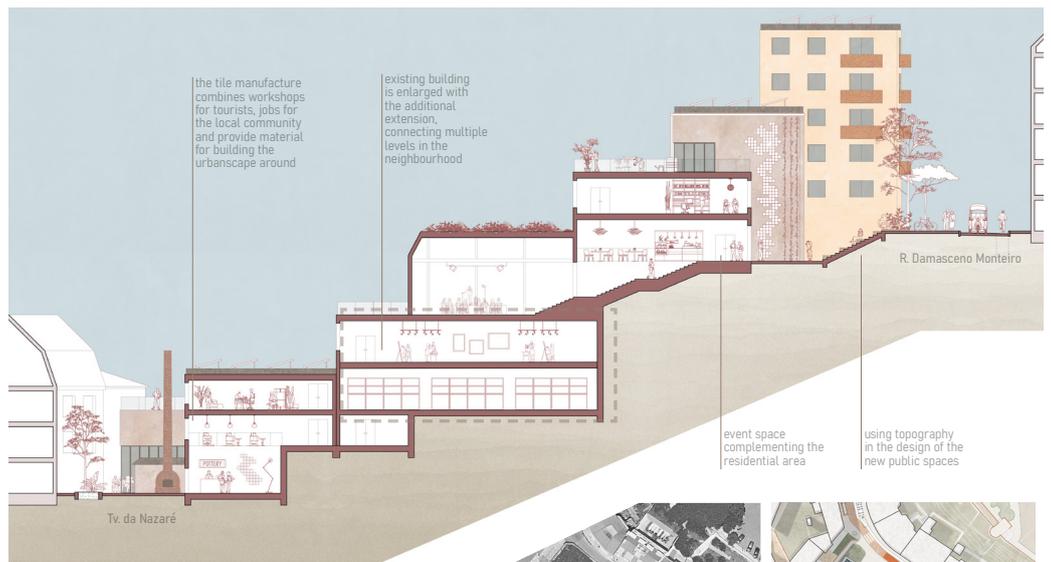
INTERGENERATIONAL CENTRE 9

The unused monastery building next to Largo da Rosa is adapted and transformed into a senior housing combined with a kindergarden to foster intergenerational interaction and strengthen local community. Providing a staircase with an escalator along the former castle walls line improves accessibility, and fosters wayfinding facilitated with vegetation and street art on now empty brick/stone walls to promote climate awareness. Repurposing historic structure along R. Marquês Pte. de Lima offers space for local businesses on the groundfloor and serves as an extension of the kindergarden's playground on the roof. Urban farming located along Costa do Castelo is connected to the senior housing and serves educational purposes for kids as well as provides fresh crops for the residents. The abandoned building at Escadinhas do Marquês de Ponte de Lima is transformed into affordable housing with varied apartments for families and young adults. Currently enclosed brownfield adjacent to this building is adapted along the existing topography for new green pockets with recreational uses.



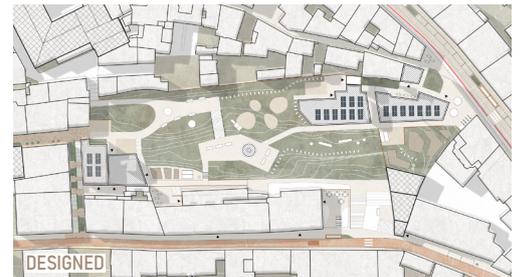
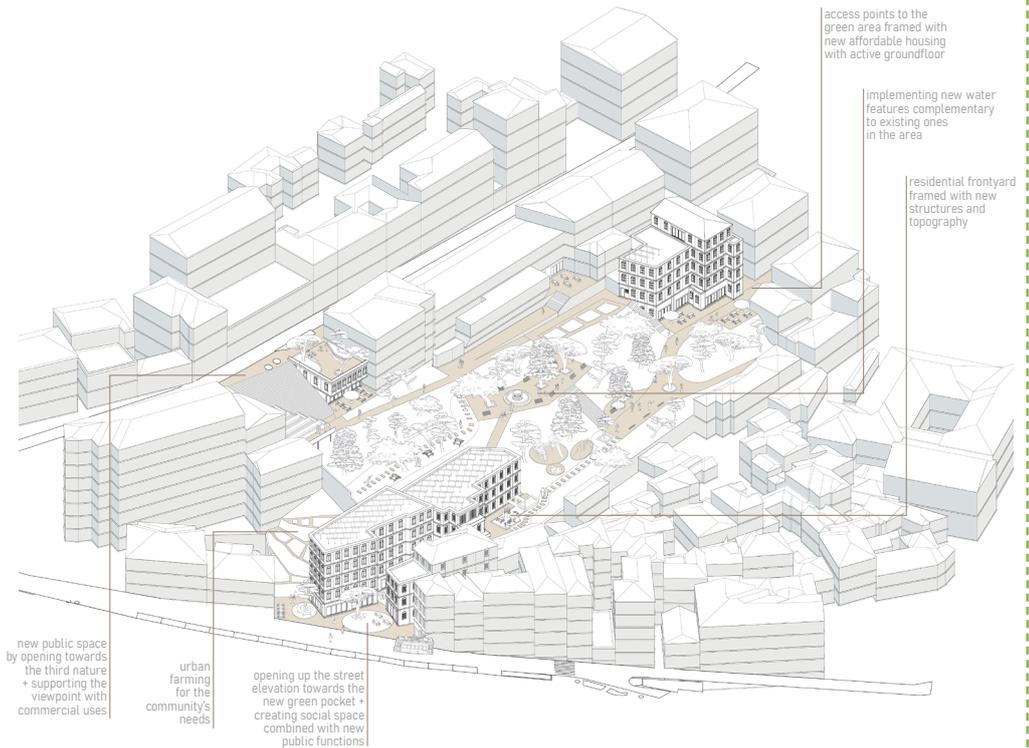
EVENTSPACE + MANUFACTURE 3

The space that currently is a brownfield becomes a multi-level neighbourhood link, providing better connection to the school area with sports facilities on Tv. da Nazaré. Former industrial structure located adjacent to the school is renovated and transformed into a tile manufacture and offices led by local artists to offer e.g. pottery/sewing workshops for tourists, hence contributing to strengthening local economy. The structure is extended towards R. Damasceno Monteiro and offers an event space and a community centre that complements new affordable housing complex. The topography of the area is enhanced and is a natural extension of the street providing space for vegetation, seating areas and bike infrastructure, where soft mobility is prioritised. The cobblestones from opening up the street surface is used as a construction material for new pathways and squares.



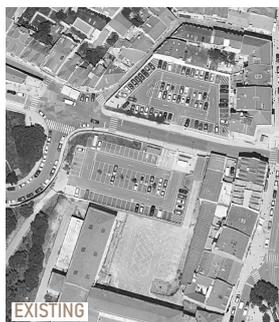
GREEN POCKET 7

The vast brownfield covered in lush greenery of the 3rd nature is transformed into an accessible green area, that provides new connections and recreational uses within the neighbourhood. Restructuring the buildings at Calçada de Santo André 43-57 serves to create a public space towards the main street as well as access point to the middle-sized recreational area. At the same time it allows to generate new, mixed-use buildings (public functions, housing, retail). Two other openings to the area are created along Costa do Castelo providing outdoor space for the benefit of Teatro da Garagem and to the west leading to Escadinhas do Marquês de Ponte de Lima. The existing topography is enhanced and most of existing vegetation preserved as well as enriched with indigenous species. In addition water features are added. Hence the brownfield is developed into a middle-sized green area, complementary to the existing Jardim da Cerca da Graça. It is important to enhance existing permeable and vegetated plots of land, especially in areas such as Mouraria, that is mostly sealed and contains little to no vegetation because of its medieval structure. Those are invaluablely beneficial for lessening the impacts of climate change, and also contribute to public health and more biodiversity.



MOBILITY HUB 4

The area that is nowadays a parking lot at R. Damasceno Monteiro and Calçada do Monte is an inactive void in Mouraria's lively structure and holds dormant potential for development. It is transformed into a multi-level, mixed-use parking house, providing space for new public functions (a library and a multimedia centre), offices, retail, a collective parking/charging station for electric tuk-tuks (described in the first strategy) and a logistic centre for last-mile deliveries. Vast roof area is covered with solar panels to power the tuk-tuks and green roofs for better water management, microclimate, and sight relations. New buildings are constructed with the use of local materials (e.g. using cork for insulation, bricks from disassembled buildings) and enhanced with local art. They frame the architecture of the monastery, and highlight its qualities. Re-opening the link to Jardim da Cerca da Graça improves the accessibility to this important green area and serves as an extension of the green and blue network. New trees planted along the street serve as a natural canopy and provide shadow during hot summer days.



BENEFITS



spaces for local businesses to enhance community's entrepreneurship



better connectivity in-between existing and designed hotspots



creating a network of smaller urban pockets that support vibrant street life



mixed-use parking house + solar panels

with HERITAGE to SUSTAINABILITY



ANNEX | ENVIRONMENTAL ASSESSMENT



Fig. 21 | Sustainable Development Goals 2030

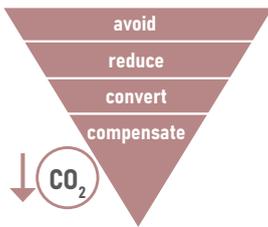


Fig. 22 | emissions reduction pyramid

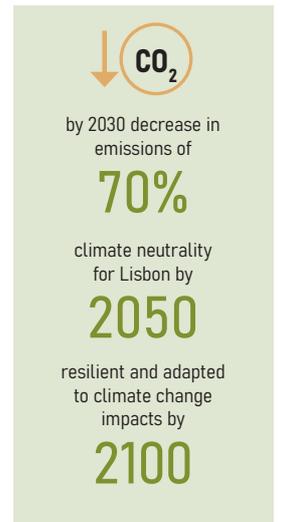
Presented design proposal and key actions embedded in it are compliant with the goals of the Lisbon Municipality described in the PAC Lisboa 2030 (Plano de Ação Climática Lisboa 2030). Those are divided into two main categories - to achieve climate neutrality by 2050 and to increase city's resilience to the impacts of climate change.

In terms of **climate neutrality**, the key actions proposed in the project align with the low-carbon hierarchy outlined by the C40 and ARUP to first avoid, then reduce emissions, and then convert to renewable energy to lastly compensate for residual emissions. The specific actions are categorized according to operational, embodied and consumption-based emissions.

In regards to achieving **resilience to the impacts of climate change**, the key actions are based mainly on the nature-based solutions that include the establishment of green and blue network in the neighbourhood. Both of these collectively mitigate the outcomes of the extreme weather events forecasted for Mouraria and Lisbon including water scarcity, UHI effect and energy poverty.



Fig. 23 | Climate Action Plan Lisbon 2030



GOAL 1: CLIMATE NEUTRALITY

EMISSIONS

EMBODIED EMISSIONS



Fig. 24 |

- prioritizing re-use and adaptation of the existing building stock, hence minimizing need of building completely new structures

- circular use of construction materials by re-using those collected from disassembled buildings and opened up street surfaces (bricks, cobblestones, tiles, etc.) hence decreasing need for materials extraction

- using locally available materials (e.g. cork for insulating the buildings, planting indigenous species), hence reducing emissions from its transport to the site

- design of new buildings and public spaces that makes them easy to maintain and repair (e.g. construction elements that are easy to replace and that are easy to clean)

3070 m²
reclaimed paved surface

60% of recycled cobblestones would cover the need to pave newly designed spaces of the green pocket



36 out of 50 designed buildings are repurposed from the neglected building stock within Mouraria



EMISSIONS

OPERATIONAL EMISSIONS



Fig. 25 |

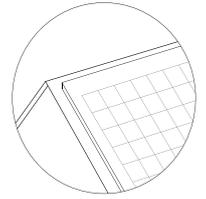
- harvesting solar power with new photovoltaic installations for the use of new public buildings, offices and households, hence making the neighbourhood more independent from fossil fuels

- street lighting provided with solar powered LED lamps

- installing rainwater harvesting systems (existing and new buildings) as well as grey-water installation (new buildings) for a circular use of water in the neighbourhood

1179 MWh

produced yearly with solar panels placed on the new and renovated buildings



that would cover almost 18% of the Mouraria's need for electricity, ameliorating the energy poverty

FOOD



Fig. 26 |

- urban farming (as a part of city urban agriculture program - *hortas urbanas*) provides residents/local restaurants with locally grown food that contributes to shorter chains of delivery and promotes healthier (vegetarian/vegan) eating patterns

- social campaigns among cafes and restaurant owners, in regards to choose locally grown food products over the imported ones, create local co-operatives between businesses and contribute to shorter chains of delivery



1493 m²
of new urban farms

90%

of Mouraria's residents with an access to an urban farm within max. 15 minutes walk

CONSUMPTION-BASED EMISSIONS

PRIVATE TRANSPORT



Fig. 27 |

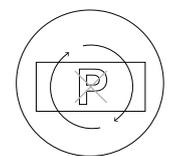
- strengthening soft mobility (implementing bike infrastructure and seating areas, reorganizing the traffic to increase safety and walkability, embedding vegetation into the public space design) influences change in mobility patterns of the residents, making it more attractive to move on foot or by bike

- new small scale public transportation system by locals for locals is based on solar energy harvested in Mouraria, hence reducing the emissions compared to the use of internal combustion engine vehicles



50

new bike parking stations



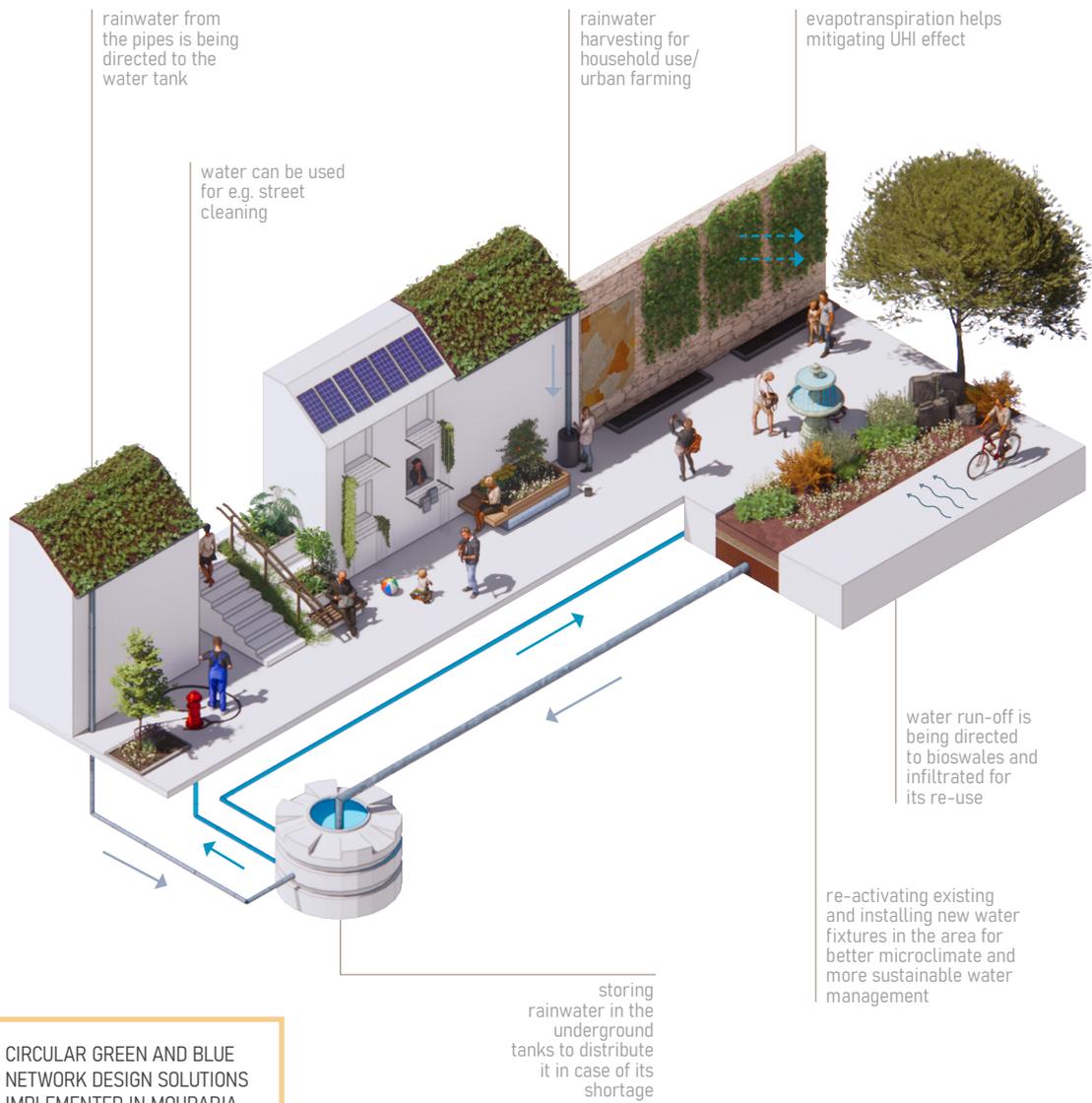
307

out of 672 parking spots reclaimed to facilitate soft mobility

Apart from reducing emissions it is also crucial to implement solutions within the neighbourhood that will make it more resilient and adaptive to the impacts of climate change. In case of Mouraria the main focus is put on the increase of heatwaves and Urban Heat Island effect as well as water scarcity on one hand and risk of flash floods on the other.

To adapt to the aforementioned climate threats, a set of nature-based solutions are implemented throughout the site. These include elements for establishing a holistic green and blue network in the neighbourhood.

| | | |
|-------------------------------------------|-----------------------------------------------------|----------------------------|
| RAILING AND STAIRCASE VEGETATION | VERTICAL VEGETATION - RETENTION WALLS/LAUNDRY RACKS | GREEN ROOFS |
| STREET VEGETATION - BIOSWALES + NEW TREES | ENHANCING 3rd NATURE | WATER STORAGE - TANKS |
| RE-ACTIVATING EXISTING WATER ELEMENTS | INSTALLING COMPLEMENTARY WATER FEATURES | HOUSEHOLD WATER HARVESTING |



CIRCULAR GREEN AND BLUE NETWORK DESIGN SOLUTIONS IMPLEMENTED IN MOURARIA

7965 m²
of new permeable surfaces covered in vegetation

649 m
of railing vegetation

452 m
of reused walls

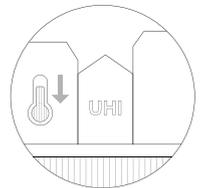
85%

of inhabitants gain access to middle sized green area within 15 minutes walk

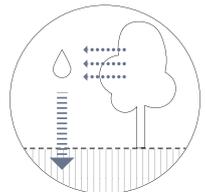
21

reactivated and new water fixtures

improved microclimate



water management together with vegetation mitigate the Urban Heat Island effect in the area through better water infiltration and amplified evapotranspiration



storing harvested rainwater contributes to sustainable water management being used to maintaining the area instead of pottable water

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All artwork presented in this project was done by the Team Members unless noted otherwise.

All orthophotographs are sourced from Google Maps. Retrieved 2023 from <https://earth.google.com/web/search/Lisbon,+Portugalia/@38.74362665,-9.16020315,110.8071912a,29015.19141356d,35y,359.99999933h,0t,0r/>

Fig. 1 | <http://epic-webgis-portugal.isa.ulisboa.pt/>

Fig. 2 | <https://i.ytimg.com/vi/9kmlUjHL0zs/maxresdefault.jpg>

Fig. 4 | https://www.lisboa.pt/fileadmin/cidade_temas/mobilidade/documentos/Lisbon_Mobility_Strategic_Vision_MOVE_2030_EN.pdf

Fig. 6 | https://encrypted-tbn0.gstatic.com/images?q=tbn:ANd9GcRyVi4xCEoUGM3EW-1LmllcXaeGC_vkBlax8lbv512ePPBIIKKSf8Y-d7T3TXKMBEgnzPU&usqp=CAU

Fig. 9 | <https://sfbike.org/wp-content/uploads/2017/07/MadroneBikeCorralParkingMural.CreditSFMTA.jpg>

Fig. 10 | https://www.wroclaw.pl/growgreen/files/news/7732/_thumb/860x420/zielona_ulica18.jpg

Fig. 15 | <https://cloudfront-eu-central-1.images.arcpublishing.com/irishtimes/3R6OUTHKQ4TGXPL6GKVCVCRHSPKPI.jpg>

Fig. 21 | <https://www.un.org/sustainabledevelopment/news/communications-material/>

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Fig. 23 | https://amensagem.pt/wp-content/uploads/2021/08/PAC_LISBOA_2030_Relatorio.pdf

Fig. 26 | <https://encrypted-tbn0.gstatic.com/images?q=tbn:ANd9GcTRmi9-3FAVv22QCfJoi7THCJGwtIEr87LmA&usqp=CAU>

Fig. 3/16/24/25/27 | Photo taken by the Team Members.

Fig. 5/11/12/18/20 | Artwork created by the Team Members.

Fig. 7/8/13/14/17/19 | Buildings structure based on data from OpenStreetMap. Retrieved 2023 from <https://www.openstreetmap.org/#map=16/38.7120/-9.1324>