

The **VISION** of the project is to design a new masterplan for Amman's Southern Gate. The goal is to transform the area into a vibrant, green neighbourhood that prioritises a high-quality way of living by creating a sustainable, comprehensive, and economically feasible urban environment.

THE URBAN COMPASS

A PROJECT BY ATELIER 19

The site has a strategic placement at the intersection of two major roads - Madaba Street and Airport Street - just north of the Madaba Bridge intersection. Most of the parcels with the plot are currently uninhabited and lack any development.

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DESIGN PRINCIPLES

THE 10 DESIGN PRINCIPLES:

1. COMPLETE NEIGHBOURHOODS
2. PEOPLE-CENTERED STREETS AND LOW-CARBON MOBILITY
3. A PLACE FOR EVERYONE
4. GREEN SPACES, URBAN NATURE, CLIMATE RESILIENCE
5. GREEN ENERGY AND BUILDINGS
6. SUSTAINABLE LIVING
7. SMART AND CONNECTED PLACES
8. CLEAN CONSTRUCTION
9. CIRCULAR RESOURCES
10. GREEN ECONOMY

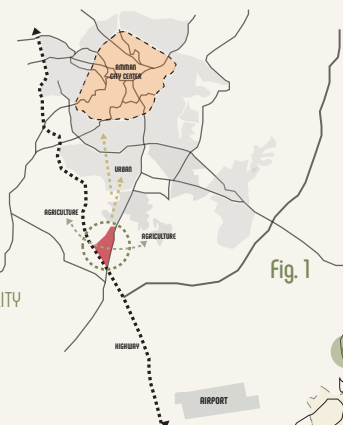


Fig. 1

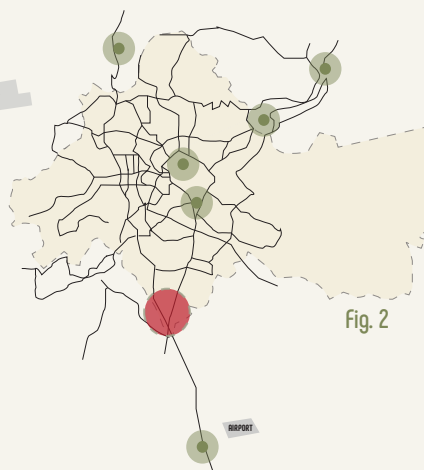


Fig. 2

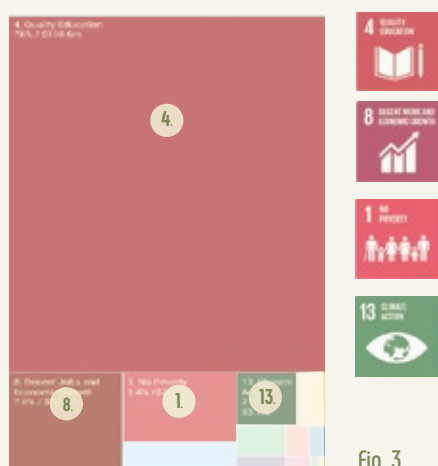
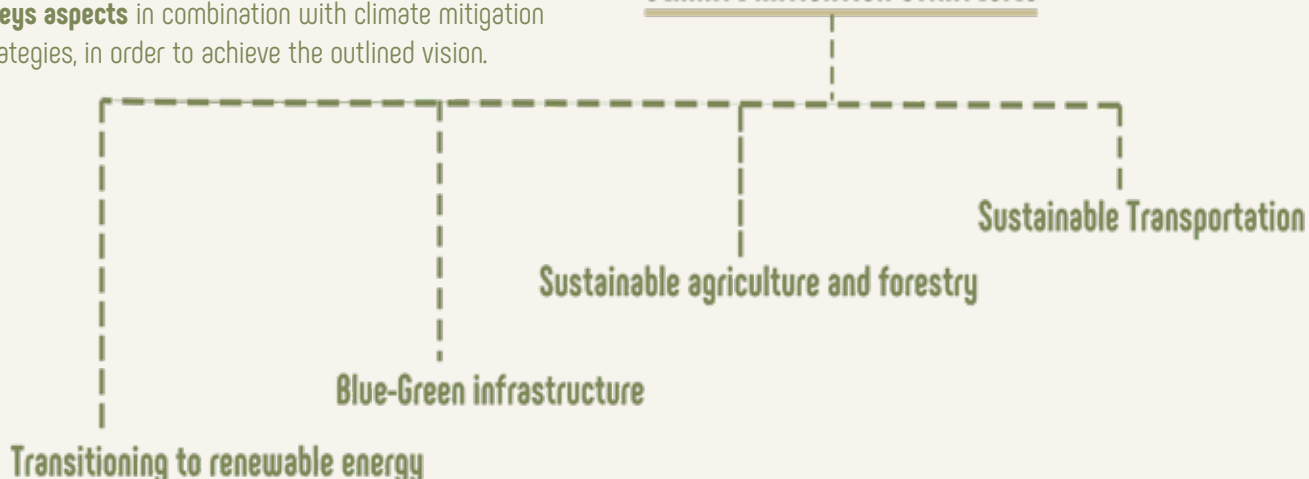


Fig. 3

OVERVIEW OF THE STRATEGIES

The extensive action plan that is further elaborated throughout the next chapters adopts the already mentioned **3 keys aspects** in combination with climate mitigation strategies, in order to achieve the outlined vision.

CLIMATE MITIGATION STRATEGIES



In order for the objectives of the design to be fulfilled, one has to get acquainted with the project area's urban, social, economical characteristics and background. An in depth research was conducted in addition to the already provided documentation. As a result, the weakness and strengths were addressed, in order to form strategies for further development on multiple scales.

During the design process, special attention was paid to **3 key aspects** that were defined during the analysis of the project area. The first one being its strategic position at the intersection of two arterial roads - Airport Road and Madaba road (Fig.1). These roads are significant transportation corridors that connect the site to key parts of the city and the surrounding area. Thus, the potential of the project area to be transformed into a core for economic, social and infrastructural development in the southern part of Amman was acknowledged.

The second one is the rising number of the population and the need of affordable housing that yet on the other hand looks into the future, reflecting sustainability, resilience and high quality of life. A specific attention was paid to the numerous number of refugees that live both in and outside the boundaries of the refugee camps (Fig2.). The formed vision will strive for offering them not only a safe environment, but also education and work opportunities - a neighbourhood for all.

The third key aspect is based on one of the SDG in Jordan for 2025 - quality education for all. As there are already quite a few existing university campuses in proximity to the project area, the idea is to create multiple small hubs, where people can engage into various workshops and courses. By integrating this the project area can also develop as the educational core of the south. The idea of the whole masterplan also reflects some of the other SDG 2025 as no poverty, decent jobs and economic growth, climate action etc..

BLUE-GREEN INFRASTRUCTURE

The climate in Amman is classified as semi-arid with Mediterranean influences. This means hot and dry summers and cold and wet winters, with **short rainy season** mostly between November and March.

In order to collect, store and re-use water, multiple solutions have been integrated into the design of the masterplan.

1) Rain gardens



LOCAL SPECIES:

Bottom zone (Wettest Area):

1. *Carex* spp. (Sedges)
2. *Echinops adenocaulos* (Globe thistle)
3. *Juncus maritimus* (Sea rush)

Mid-Slope zone (Transition Area):

1. *Salvia spinosa* (Spiny sage)
2. *Achillea santolina* (Yarrow)
3. *Euphorbia rigida* (Gopher spurge)

Upper zone (Dry/Edge Area):

1. *Thymus capitatus* (Wild thyme)
2. *Stipa capensis* (Cape grass)
3. *Herichrysum stoechas* (Everlasting flower)

2) Permeable surfaces

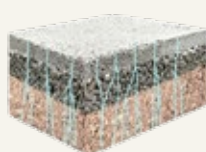
The design focuses on people-centered streets and low-carbon mobility, but the necessary infrastructure, car parks as well as the pedestrian paths use permeable surfaces, in order to control water run-off and ensure water storage.



Permeable pavement



Car parking zones



Permeable concrete

3) Wetlands/Bioswales

The wetlands and bioswales are one of the central design elements, as the idea is for them to run through the urban fabric, but also form unity with the in-between green spaces. Together they shape the "courtyards" between the building blocks. Each bioswale is connected to the central wetland, but also to a smaller one on its other end.

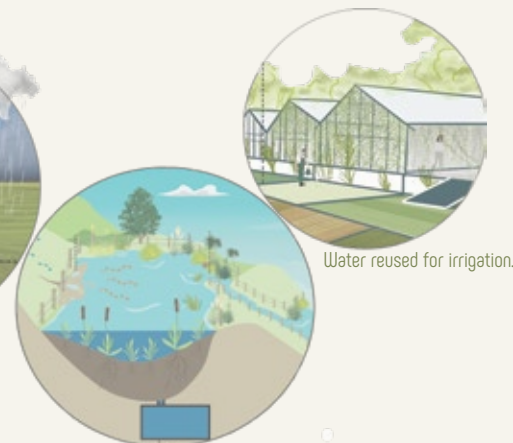


MENTAL HEALTH BENEFITS

1. Stress Reduction
2. Enhanced focus and mental clarity
3. Social connection and recreation
4. Lower depression risk



The wetland catches the stormwater, it removes pollutants and it filters the water. It also ensures better erosion control.



The wetland is also connected to water storage tanks, in order for the water to be reused.

4) Greenery

Use of native to Amman species, to avoid introduction of alien species.



Pistacia atlantica



Ziziphus spina-christi

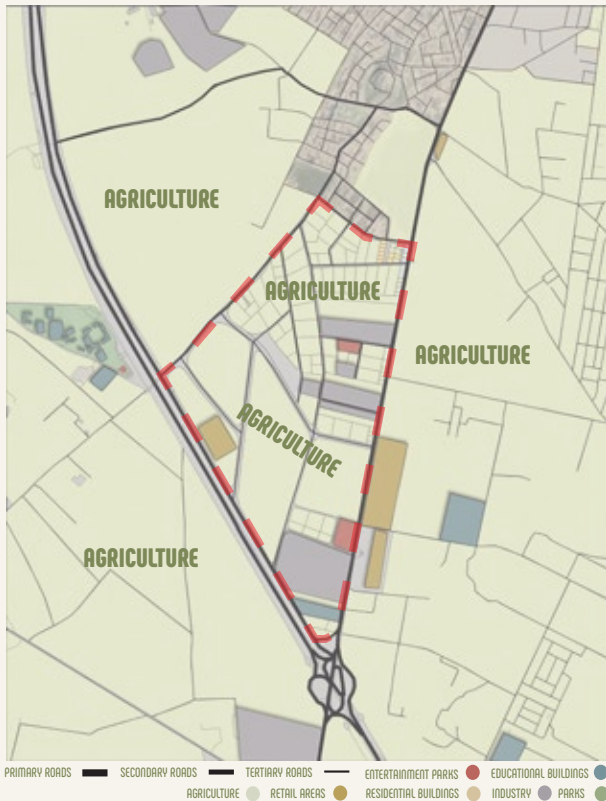


Quercus calliprinos



Quercus ithaburensis

SUSTAINABLE AGRICULTURE



When analyzing the project area and its vicinities, it was clearly visible that **agriculture** is dominant in the area. The fields lack proper boundaries and infrastructure, moreover they blend in with the existing residential units in the upper left corner of the area in interest.



In the new vision for the project area, the scattered agricultural fields that lacked any quality and structure are being transformed into special "urban farming zones". They vary in scale and position, but are well-integrated into the new masterplan, as important elements that will not start a shift towards more sustainable agriculture, but moreover boost the local economy.

LOCAL MARKET

Local food supply
Promoting organic agriculture
Job opportunities



Reduced Food Miles & Emissions - growing food close to the consumers reduces transportation needs and cuts greenhouse gas emissions



URBAN FARMING
Rainwater harvesting
Sustainable energy use
Educating refugees
Involvement of schools

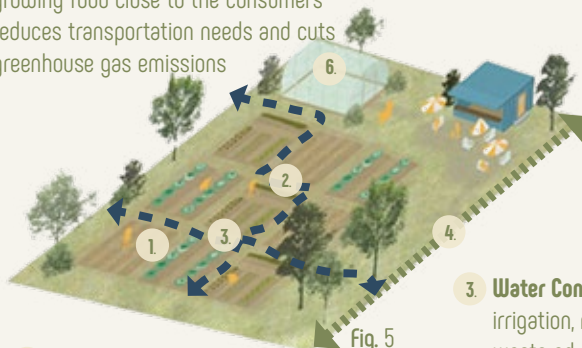


Fig. 5

1. **Reduced Pollution** - no use of synthetic fertilizers and pesticides, which results in better water and air quality
2. **Soil Health Improvement**- crop rotation, cover cropping and reduced tillage help to improve soil structure and fertility

3. **Water Conservation** - efficient irrigation, reuse of water reduce waste and preserve water sources

4. **Living Hedges** - a natural barrier that also enhances biodiversity, air quality and aesthetics.

5. **Waste Reduction & Recycling** - organic waste can be used as fertilizer, closing the loop in the urban ecosystem



6. **Greenhouses**- CO2 capture from heating systems and nearby emission is introduced into the greenhouse. It is used by the crops for photosynthesis

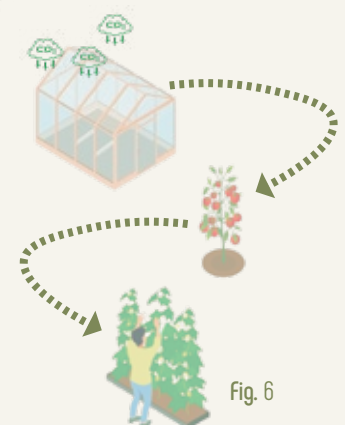


Fig. 6

SUSTAINABLE TRANSPORTATION



As already mentioned, the project area is located at a strategic location - at the intersection of two arterial roads - Airport Road and Madaba road. These roads are significant transportation corridors that connect the site to key parts of the city and the surrounding area.

In contrast to its periphery, the area itself lacks any infrastructure. There are no existing streets, but rather dusty small connecting roads in between the agricultural fields.

As the vision focuses on promoting people-centered streets and slow mobility, it was decided for only the main arteries within the area to be designed to accommodate car traffic. Pedestrian and cycle paths on the other hand are to be intertwined with the bioswales, in order to provide more quality to its users and so that the nature- like feeling can stimulate them to choose the slow mobility within the project area.

Public transportation is not available in the area.



As there are quite a few university campuses nearby, the walking distance from the project area to them was analyzed, so that the urban fabric can be positioned in a such a way that the walking distance to each institution does not exceed 30 min on foot.

15 min

A bicycle for all

At every parking there will be a spot where one can take a shared bicycle, in order to promote better slow mobility.



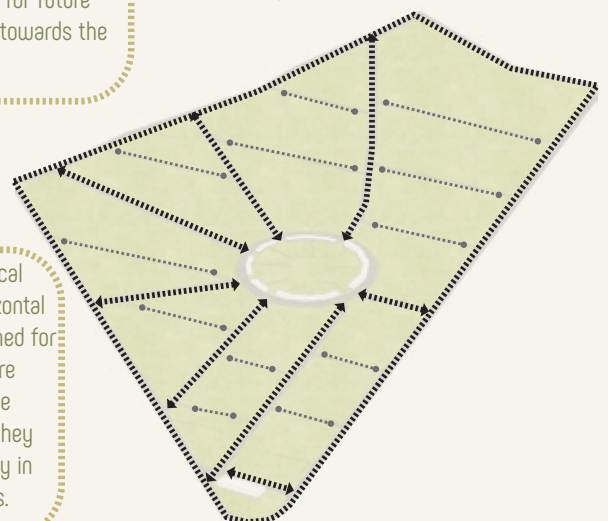
Along the main axes there are multiple car parks where people can leave their cars, as the in-between courtyards are car-free zones



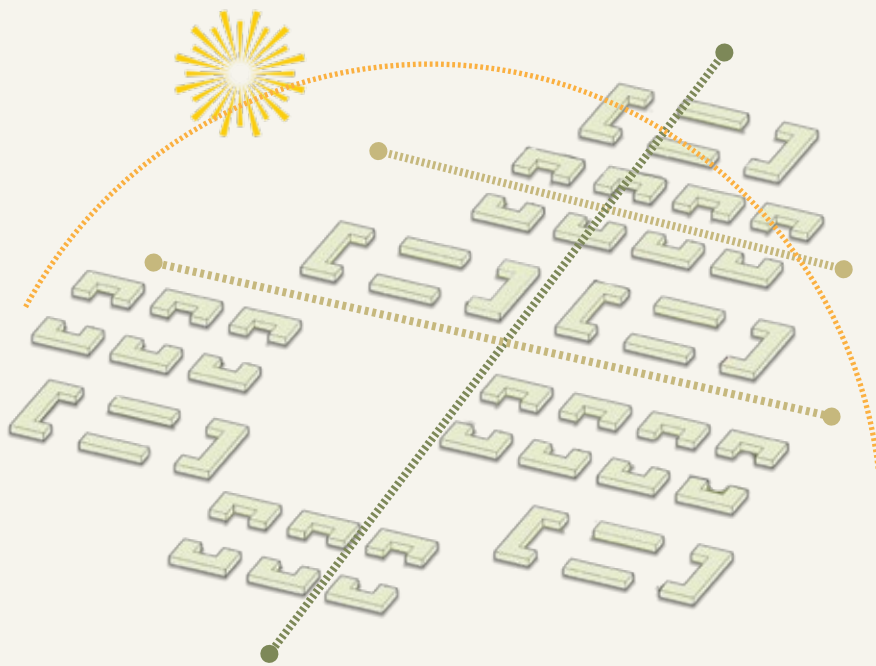
The cycle paths are combined with the pedestrian paths and shape the inside of the design area. There is the possibility for future extension towards the periphery.



There are main vertical and secondary horizontal axes that are designed for cars. The parkings are arranged close to the horizontal ones, as they facilitate access only in case of emergencies.

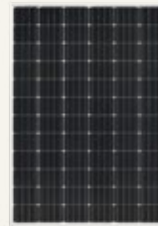


TRANSITIONING TO RENEWABLE ENERGY



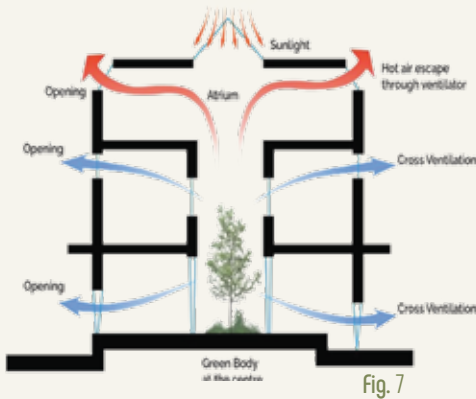
Before further elaborating on the integrated strategies for renewable energy, it is vital to mention the positioning and orientation of the urban blocks. In order to maximize the available area for solar panels the long sides of the buildings (with a few exceptions, due to the pattern of organisation) face north - south.

1) Solar panels - Monocrystalline Silicon Panels



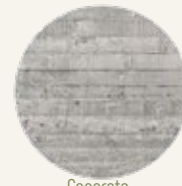
Efficiency: 18-23%
(highest among common types)
Lifespan: 25-30 years
Look: Black, sleek, uniform,
Performs well in low light
Ideal for grid-ties system

2) Natural ventilation and atriums



1. The buildings do not require mechanical systems, which leads to reduces electricity use and lower carbon footprint.
2. Improved indoor air quality and reduced humidity.
3. Helps maintain comfortable temperatures without air conditioning.
4. Reduces dependency on fossil fuels and artificial cooling.
5. Especially effective in mild or hot climates with good air flow.

3) Thermal mass



The residential building blocks are designed with concrete and stone, in order to use their ability to absorb, store and release heat.

4) Shade Structures



Tree biomass

Tress provide partial or full shade, reducing solar heat gain on building, walkways. Another benefit is that they lower the air temperature through evapotranspiration. In order to grow, they absorb carbon dioxide.



Wooden shelter

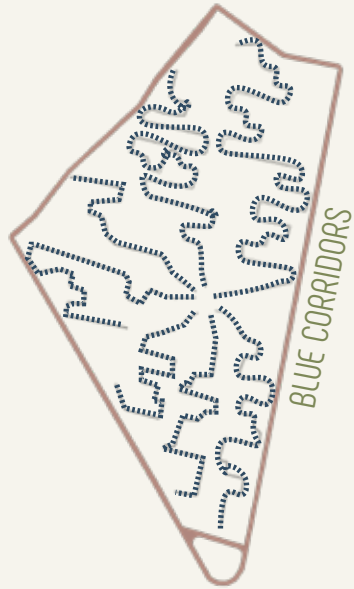
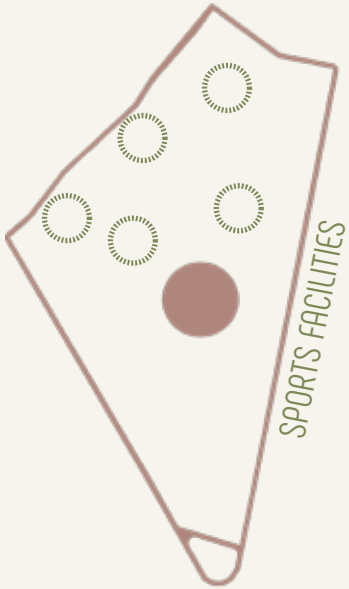
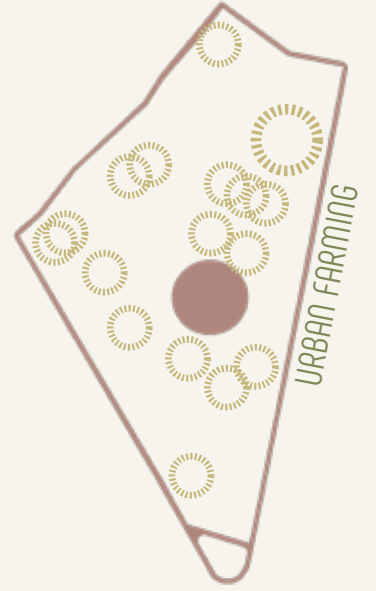
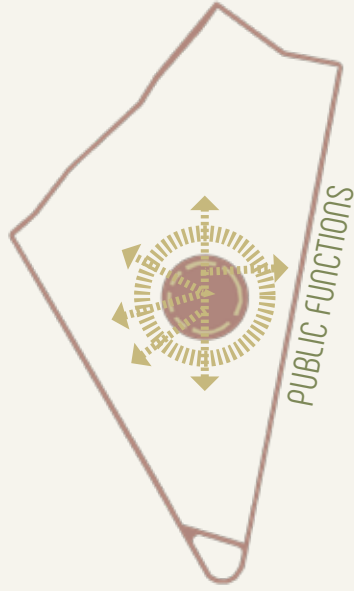
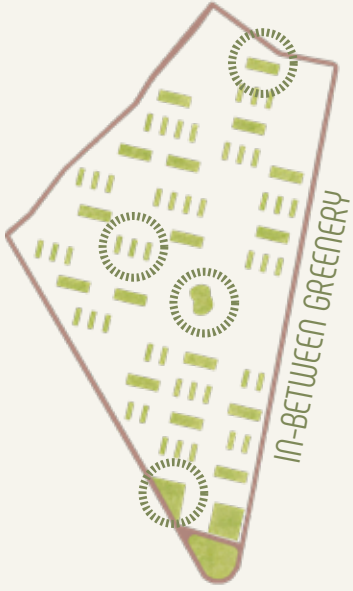
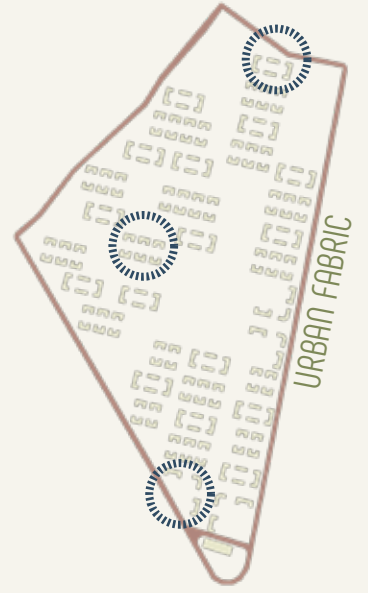
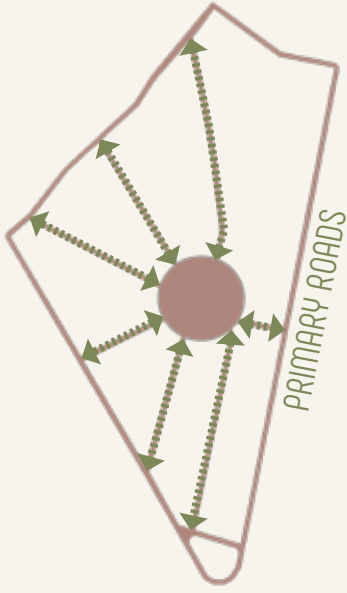
Wooden structures are sustainable, versatile and more over aesthetically pleasing soltuion that can perfectly blend in the context of the public spaces. Moreover, wood is a renewable material that stores carbon throughout its life cycle.

5) Solar chimney + wind catcher



The solar chimney is oriented towards west, in order to be more effiecient. With the help of the solar heat the chimney warms the air inside a tall vertical shaft. While the hot air rises, cool air comes in from the wind catcher that captures cool wind from the rooftop level. It is channeled down into the space, increasing the indoor air pressure. In this way the warm air is pushed out from the solar chimney.

BUILDING MORPHOLOGY AND TYPOLOGY



BUSINESS MODEL



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Image permeable concrete - Pinterest. (n.d). Pinterest. <https://pinterest.com>

Fig. 5 - Pinterest. (n.d). Pinterest. <https://pinterest.com>

Fig 6 - Pinterest. (n.d). Pinterest. <https://pinterest.com>

Fig. 7 - Layakarchitect. (2024b, April 21). Atrium. Layak Architect. <https://layakarchitect.com/architecture-atrium-definition-advantages-disadvantages/>

Image solar panel - Monocrystalline Solar Panel 330W - KF Solar Tech Group Corp. (n.d). KF Solar Tech Group Corp. <https://www.kfsolar.com/product/monocrystalline-solar-panel-330w/>

Image concrete - Pinterest. (n.d). Pinterest. <https://pinterest.com>

Image stone - Pinterest. (n.d). Pinterest. <https://pinterest.com>

Image wooden shelter - Pinterest. (n.d). Pinterest. <https://pinterest.com>

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