

THE JOY OF THE VEGETABLE GARDEN

EUROPAN 17 - SPAIN
EL PRAT DE LLOBREGAT

The Llobregat delta is one of the most vulnerable European landscapes in the face of climate change. That is why we have decided to understand the proposal not only in a current context, but also in an increasingly near future situation.

- The rise of the sea level and the natural subsidence of the delta would cause that over the years the crops will be replaced by marshes and the salinity of the aquifer will increase.
 - The increase in the frequency and intensity of the rainfalls puts the infrastructure system in risk in a period of 100 years and of the entire Prat de Llobregat in 500 years.
 - Urban growth (mainly industrial estates) and the current agricultural context with low altitude or chards means that there is a lack of shade in the territory and the heat island effect is increased.
- The only areas of climatic refuge are located around the marshes.

Due to this effect, it is probable that the delta productive areas evolve to a more resilient situation, shifting agricultural areas, filling existing gaps and finding new uses to flooded spaces.



1

Given the delta's vulnerable situation, its survival as a natural space of interest lies in its capacity for connectivity with other natural environments. The area where the project is located is transformed into a junction point that will connect the agricultural park with the Llobregat, creating an ecological corridor approaching it to Barcelona, giving value to the agricultural heritage of the area.



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With the aim to connect the agricultural park with Barcelona, a critical look at the transformation of the C-31 is proposed. The original project (in a context of the great importance of the private car) proposed to make an underground infrastructure. In a future context, where the car will become less important (the economic and ecological impact will have a notorious effect), it is proposed to act only in the nodes in order to redirect the fast traffic direction to the B-20, allowing the C-31 become a metropolitan avenue which will give continuity to the Gran Vía of Barcelona and also connect different municipalities.

The section of the new avenue will lose one traffic lane on each side, the speed will be reduced, allowing to reduce from 3.25 to 2.75 the width of the traffic lanes and remove the hard shoulders. The reduction of the asphalt surface will allow the incorporation of a large central green axis, as well as two sidewalks that will incorporate two lines of trees and a bicycle lane.

The transformation of the C31 highway into an urban avenue provides a critical look at the role of infrastructures around the city.

These infrastructures are an overlapping of very different scales with an insensitive look with the environment. This creates a barrier between urban and agricultural contexts. The old roads and canals cut by the infrastructures create a fragmented landscape that separates the city from its surroundings. This situation is emphasised in the study area where the site is doubly isolated, both from the city and the fields, becoming a marginal space.

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Once the infrastructure is transformed into an urban scale, it becomes much easier crossing the site (from 1 to 13 crossing points). In this way, the city connects and recovers old traces of canals and agricultural path within the study area. These traces will go under the B-20 highway (from 1 to 5 crossing points), connecting the area also with the rest of the Agricultural Park, transforming into a more permeable and walkable territory.

The new urban planning respects the original proposal by Kees Kaan and Jaume Carné. Integrating the large longitudinal park with the transformation of the C-31 road into a proposal for metropolitan connectivity. However, it also proposes another cross connectivity to the previous one. This connectivity, on a smaller scale, reflects the historical link between the city and its territory. A link represented by water and canals, which have been articulating the different growths of the city.

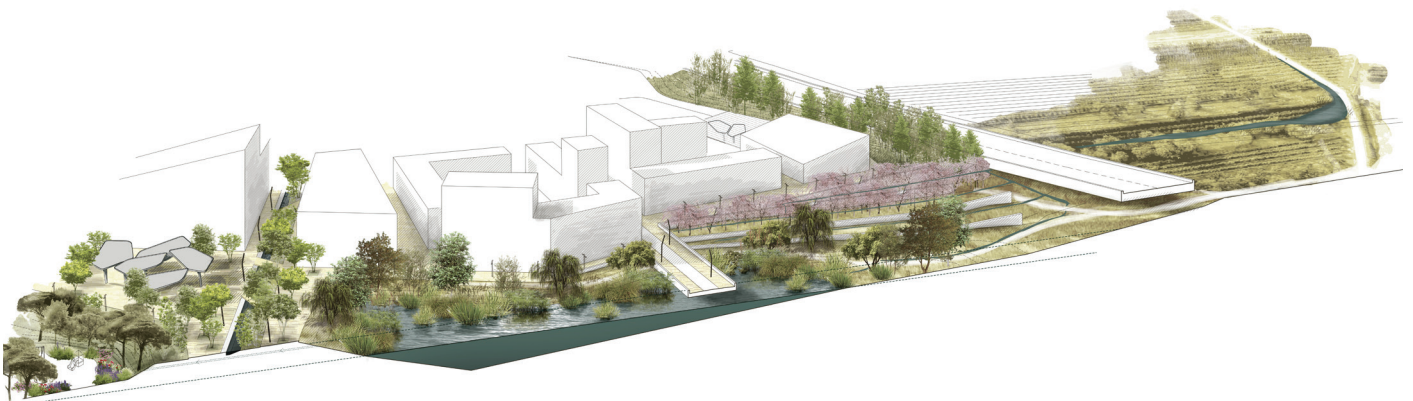
The cross permeabilities are more than a connection element between the city, the new urban growth and the territory. These axes will become the main element of water management. Helping to mitigate climate change effects.

These axes articulate the lost agricultural fields due to the sea level rise with the city. This way of enhancing the value of the local historical heritage allows to generate synergies between the different productive activities.

Flooding risk is protected by a dune system that also protects from the highway's noise. The water is redirected to the retention basins in order to be managed. In the case of severe flooding, water is redirected to other ponds for infiltration. A larger area is foreseen to absorb T100/T500 floods.

With rising temperatures, it is important to have climatic refuge areas. For this purpose, the axes reach down to the water table, generating surface water and abundant vegetation.

The excavation of the axis under the B-20 highway solves the connectivity problem. It also makes possible to reach the water table and create a climatic refuge space. The level difference between the surface water and the city allows to have a spot for accumulation and infiltration in rainy episodes. This terraced space also allows the agricultural fields get into the city.



An ECO-DISTRICT with underground traffic system and entrances from the perimeter streets is implemented; freeing up the area taken up by cars and creating a continuous pedestrian and micro mobility public space. The new proposed structure is based on the key elements of the streets, such as green spaces, water channels and commercial areas.

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According to Jane Jacobs, the following conditions must be met in order to design a successful and an attractive neighbourhood: Primary mixed uses / Small blocks / Converging paths / Density. Implementing those principles, will help to create a neighbourhood that is not only aesthetically pleasing but also fosters a strong sense of community, social interaction, and economic vitality as a result of a 15 minutes city with all the services, amenities, job opportunities and residential offers.



4

PASSIVE SOLUTIONS: Solutions such as reinforced thermal insulation, solar protection and an optimal cross-ventilation in all homes have been incorporated in order to reduce the building's energy demand through passive measures.

- The roof over the patio works as an atrium in winter capturing heat, and a solar chimney in summer where the atrium will be opened allowing it to dissipate heat and increasing air speed to improve the thermal sensation and comfort.
- Roller shutters have been installed to control solar irradiance in summer.
- Façades protected with SATE (ETICS) providing isolation to the building and helping to prevent thermal bridges and leaks.
- The use of Posidonia from the proposed plantations allows the use of local materials in a cradle-to-cradle process. This reduces the carbon footprint of the proposal.
- Vegetation in courtyards, roofs, planters ... will mitigate the heat island effect and create a more pleasant living condition. Also in roofs, the urban gardens will provide more inertia.

ACTIVE SOLUTIONS: Those who will ensure to keep the buildings in comfortable conditions: air conditioner, heat pumps, radiant heating, heat recovery ventilators and electricity lightning

- Reuse of the rainwater collected on the roof and stored in an underground cistern for irrigation. Also reuse of the non-polluted grey water from the bathrooms and kitchens
- Using an aérothermal system (also known as an air-source heat pump) in combination with a radiant floor heating system can be an effective way to reduce energy consumption and increase energy efficiency for heating and cooling indoor spaces.
- Using solar panels in pedestrian areas is a promising and innovative approach to harnessing renewable energy while promoting sustainable urban development.
- Using solar panels to reduce our reliance on fossil fuels and mitigate the climate change, saving electricity bills and providing an opportunity for energy self-sufficiency and resilience.