

**UPCYCLE
BARCELONA**

**COGENERATIVE DESIGN
STRATEGIES FOR A SUSTAINABLE
URBAN METABOLISM**



UPCYCLE

COGENERATIVE DESIGN
STRATEGIES FOR A SUSTAINABLE
URBAN METABOLISM



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URBANISM
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Vrije
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ETSAB

Escola Tècnica Superior d'Arquitectura de Barcelona, Universitat Politècnica de Catalunya

VUB

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With the collaboration of

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FOREWORD

This research by design report contains the results of the two-week Erasmus Intensive Programme organized in Barcelona during spring 2014. After the organization of two summerschools in Japan – Resilient Ishinomaki 2011 and 2012 – and two masterclasses in Brussels – Rework 2012 and End of Line 2013 – it was decided to expand the scope of the international research by design workshop in Barcelona by focusing on the potential relation between urban design, urban metabolism and ecologies. As for previous events a specific approach, methodology and graphic tools were defined in order to tackle this empirical investigation.

European Commission Lifelong Learning Programme funding offered the Faculty of Architecture of Université Libre de Bruxelles (ULB) the opportunity to organize this event jointly with Escola Tècnica Superior d'Arquitectura de Barcelona (ETSAB), Universitat Politècnica de Catalunya (UPC). Nadia Casabella and myself, of the Laboratory on Urbanism, Infrastructure and Ecologies (LOUISE, ULB), worked jointly with Carles Crosas and Jorge Perea, of the Laboratori d'Urbanisme de Barcelona (LUB, UPC) for six months to prepare the event. We were assisted by Andrea Bortolotti and Samuel Llovet. I want to thank all these partners for the energy and passion they dedicated to the organization of this research by design workshop. As with previous workshops, we all shared

the hypothesis that a multicultural and transdisciplinary research by design exploration can operate as a tool to help bridge the gap between scientific research and expertise on the one hand and the empirical realities of urban transformation on the other.

Thanks to intensive collaboration with the Barcelona Regional local development agency, it was possible to ground this research by design workshop in the specific context of Barcelona Zona Franca. I want to thank Willy Müller, Juan Carlos Montiel, Marc Montlleó, Jordi Fuster and Aleix Coral for their active collaboration and for the expertise they offered. I would also like to thank the Concorci de la Zona Franca Barcelona for providing us with a large office space during the two weeks of the workshop.

Following the successful Brussels Masterclass in 2013, it was decided to prolong the collaboration with the Department of Project Methodology of Università IUAV di Venezia and the Cosmopolis Centre for Urban Research at the Vrije Universiteit Brussel (VUB). I would like to thank tutors Jens Aerts, Cristina Renzoni, Michael Ryckwaert, Maria Chiara Tosi and Fabio Vanin for their active involvement in this workshop. I also extend my thanks to the 53 students from ULB, UPC, IUAV and ULB who took part in this two-week intensive programme. The quality of the projects published in this report is a testimony to their dedication.

I also wish to thank all the local experts who contributed to feeding the discussions held during the workshop. Marta Carrasco, Vicente Guallart, Konstantinos Kourkoutas, Salvador Rueda, Roberto Soto, Joan Trullén i Thomas and Rosina Vinyes offered key lectures to understand both the theme and the site explored during this workshop. We also thank Maria Buhigas, Josep Parcerisa, Georges Pirson, Jordi Ros and Maria Sisternas for their active participation in the project reviews and juries.

Last but not least, I would like to thank both the Université Libre de Bruxelles and its Faculty of Architecture for providing the funding to publish this research by design report. We hope the theoretical reflections and design proposals presented in this publication will help to unveil how urban metabolism and ecology could transform the practice of architecture, urban design and planning in the future.

Geoffrey Grulois

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COGENERATIVE DESIGN STRATEGIES FOR SUSTAINABLE URBAN METABOLISM

Geoffrey Grulois & Andrea Bortolotti

In a time of economic crisis and when the environment is under increasing pressure, cities and metropolitan regions can play a key role in the move towards a sustainable future. Cities are now responsible for 75% of global energy consumption and 75% of all carbon emissions. In Europe, despite the fact that industrial activity is being moved out of urban areas, cities continue to generate most of the negative externalities associated with global economic activity in the form of water and air pollution, and waste production.

In order to address the challenges of the 21st century, which include reducing cities' dependence on external resources such as water, energy and raw materials, and reducing the negative externalities, we need to re-conceptualize urban space, adopting an ecosystem approach. Urban areas need to be conceived of in terms of the cycles of energy, materials and water, if we are to be able to understand and manage resource consumption, waste disposal and the associated externalities. Within this context *urban metabolism* is emerging as a global approach that focuses on the description and analysis of the flows within cities.

Urban metabolism can be defined as “the sum total of the technical and socio-economic processes that occur in cities, resulting in growth, production of energy, and elimination of waste” (Kennedy et al., 2007). The concept belongs to the field of urban ecology, and focuses on the flows of water, energy and materials that are processed and exchanged between a city and its surrounding region (Magnaghi, 2000). Today city's metabolism and economy are open systems of global flows

that move along its infrastructure networks. Tap water, for example, is usually diverted upstream from dammed rivers or from groundwater aquifers, both of which may be limited resources. Even though most European cities treat their wastewater, many pollutants are still discharged into surface water bodies: rivers and oceans. Most of our electricity is produced by hydrocarbon-fuelled power plants located far outside cities. Moreover, as a result of the processes of deindustrialization in Europe, manufactured goods tend to be shipped in from around the world to be consumed mainly in urban centres. Solid waste materials pose major problems to the urban landscape. The overall trend is of cities that are becoming detached from materials and resource production.

Interest in urban metabolism is rising as the current trend of massive urbanization is leading to a dramatic increase in environmental pressure on urbanized areas throughout the world (UN, 2011). In fact, as global demand for resources, goods and energy continues to grow, understanding the metabolism of the city has become extremely important for both ecological and economic reasons. Until very recently urban design and architecture devoted little attention to ecology, being strongly grounded in the western culture of humanism. Twentieth-century modern architecture and urbanism can be understood in relation to what Michel Foucault termed the episteme of human sciences (Foucault, 1966). The modern house, public space, neighbourhoods and cities are all designed in order to serve the welfare of human beings. Today, however, we can no longer consider architecture or cities without taking into account the externalities and waste produced within global ecosystems.

The debate on the ecological approach within urban studies has its roots in the late 19th century, with the pioneering urban planning work introduced by the biologist and sociologist Sir Patrick Geddes. It was in the 1960s that a global environmental awareness emerged, flourishing in the following decades through authors such as McHarg (1969, 1995), Hough (1984), Forman (1986, 1995) and Tjallingii

(1996). These approaches have crystallized in the discipline of landscape and urban ecology, which emphasizes the role that natural and green spaces can play within the city through concepts such as green infrastructure and ecosystem services.

Landscape ecology can be seen as a spatial application of urban metabolism principles, where the focus is on the study of natural landscape dynamics somewhat akin to the way industrial ecology studies the dynamics of technological production. Nevertheless, it is important to acknowledge that 20th century modern architecture and urbanism displayed little interest in ecological questions until recently.

Urban metabolism emerged in the 1970s with the work of biologists such as Paul Duvigneaud in Belgium, who was the first to conceptualize global material flows in cities, including both natural and industrial ecosystems (Duvigneaud et al., 1977). However, these studies confine themselves to the global level and are quantitative; they do not provide tools to formulate spatial solutions for balancing the ecosystems of cities and their regions.

Since then a wide range of literature on detailed and prescriptive concepts concerning urban metabolism has emerged (Kennedy, 2011), in which the concept of the metabolic loop has been developed. Working from within the concept of eco effectiveness, the focus is no longer the objective of reducing the threat of waste and emissions, but rather that waste itself can also be used. The cradle-to-cradle (C2C) approach (McDonough & Braungart, 2002) is perhaps the most well known example of eco effectiveness, where waste products are regarded as a resource (nutrient) for the biological cycle or the technological industry cycle. In urban design this approach focuses on capturing – rather than removing – valuable materials and the chemical content of waste and wastewater. Although the C2C founders and partners have been involved in many architectural projects, their main focus is on the study of building material cycles, without taking into account the metropolitan territory as an ecosystem.

Urban metabolism has found many applications in the field of industrial ecology (Erkman 1998). Eco industrial parks, such as Kalundborg in Denmark and Fujisawa in Japan, function on the basis of industrial symbiosis, where the different activities mutually benefit each other through heat and power cogeneration, waste treatment, and the reuse and recycling of by-products. Other examples of eco effectiveness include sustainable neighbourhoods, such as the Solar City of Linz and Hammarby in Stockholm, new mixed residential settlements that aim to become low or no-carbon urban areas, mainly reducing emissions through the use of insulation and passive technology for heating and public/slow-mobility transport. Some make use of decentralized forms of urban utilities at the district scale, such as electricity micro grids, decentralized wastewater treatment plants or heating networks, but which function as major nodes and processing devices (Nelson, 2010). In Barcelona the municipal authority has elaborated the concept of a smart city block as a way of creating sustainable neighbourhoods by upgrading the infrastructure and architecture of what remains of Cerdà's grid.

These examples of eco-efficient industrial parks and sustainable neighbourhoods demonstrate how the issue of urban metabolism is not addressed in direct relation to the metropolitan territories. They also show that there is a gap between the concerns of landscape ecology (the natural ecosystem) and those of industrial ecology, which are linked to the engineering of flows rather than to the design of space. This Erasmus Intensive Program aims to bridge the gap between industrial and landscape ecology by asking how urban metabolism and its design application could become a tool to achieve long-term resilience and sustainability in industrial areas of metropolitan regions, which are facing huge environmental pressure and increasing uncertainty due to the economic crisis.

A workshop was set up in which the possibilities for transforming the global economic flows in an old industrial

area into sustainable and dynamic parts of a larger metropolitan region. The example used was the Zona Franca, an old industrial area in Barcelona located next to the seaport, with a high density of infrastructure for the transport of energy, raw materials, goods, food and water. The aim of the workshop was to go beyond the energy and environmental issues usually addressed individually – for example energy and water efficiency in buildings and green space facilities in cities – and to address these from the perspective of urban and landscape design. Behind this was also a wish to raise the status of urban metabolism from a purely technological concept to the level of spatial strategy and quality.

How can large-scale industrial areas address the environmental issues of the 21st century? How can we take advantage of global economic flows to upcycle their underlying urban and regional systems? These are some of the questions raised in the workshop.

The workshop started by studying and redesigning the cycles of water, energy, materials and transport crossing four sites of 1km² located in the Zona Franca (the sites are described in the following section of this book). Tracking the cycles of these flows allowed students to understand the interaction of local scale with regional scale and global scale in an ecosystem approach. Following two days of intensive immersion into the specifics of the Zona Franca, which included site visits and lectures by local experts, eight groups of students were asked to develop possible scenarios for the future of the area (2030) by upcycling the four types of flows addressed in the workshop: water, energy, materials and transport. These scenarios were used to try and understand whether the ecosystem approach of urban metabolism, once translated into the spatial context, can be implemented at the level of urban projects and design strategies.

During the second week, the scenarios were worked out into cogenerative design strategies. 'Cogeneration' usually refers to the simultaneous production of electricity and heat

by an engine – heat being ‘waste’ – which is recycled for other uses. The concept of cogenerative design strategies investigates the capacity of every part of an area to play an active role in maintaining the ecological balance of urban metabolism. Upcycling is the process of converting urban waste into new materials with an added value for a city. Within this context the workshop explored urban design strategies that are aimed at resource efficiency, spatial quality and economic dynamism through new programmatic and morphological hybrids that transform each other’s ‘waste’ into new inputs. The workshop emphasized the use of an ecosystems approach that considers all technical and socioeconomic processes that occur in cities and that result in smart growth, economic vitality, efficient use of energy, waste elimination and qualitative space.

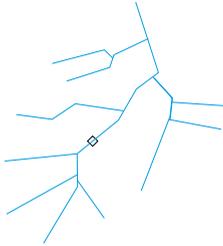
Following this introduction, the two local coordinators from the Escola Tècnica Superior d’Arquitectura de Barcelona (ETSAB) present the challenges of the workshop sites in the Zona Franca. In the second part of this research by design report, the eight projects are presented by the students and discussed by the tutors who guided them during the two weeks of workshop. At the end of this section, local experts from Barcelona discuss the challenges facing Zona Franca and its possible futures. In the last part of the book, tutors from Université libre de Bruxelles (ULB), Vrije Universiteit Brussel (VUB) and Università Iuav di Venezia IUAV present a comparative perspective on industrial areas in the Veneto and the Brussels Capital Region.

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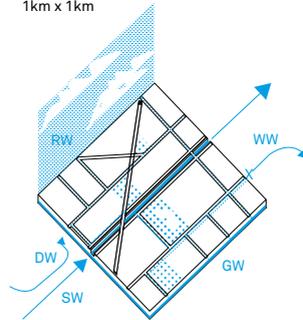
> **Water**

Rainwater
Groundwater
Drinking Water
Wastewater
Surface Water

20km x 20km



1km x 1km



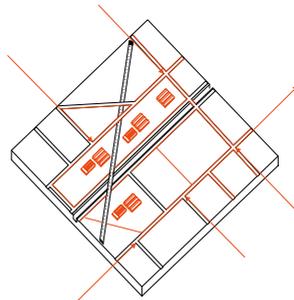
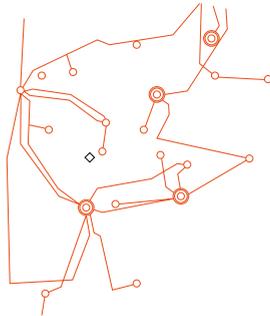
> **Materials**

Transformer
Stock and Sale
Consumer



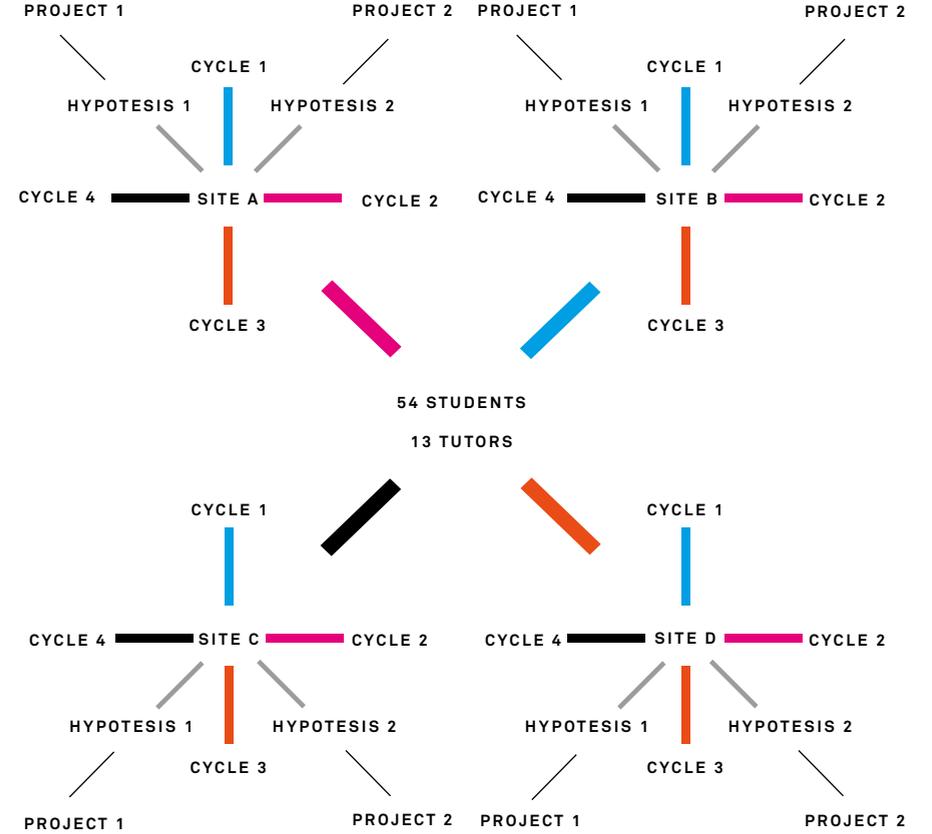
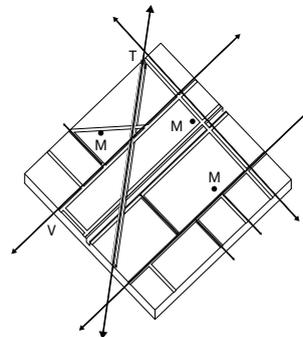
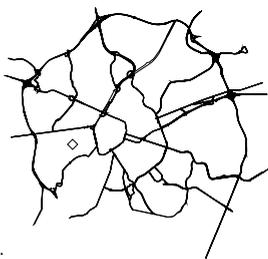
> **Energy**

Heat producer
Hard surface
Energy Grid

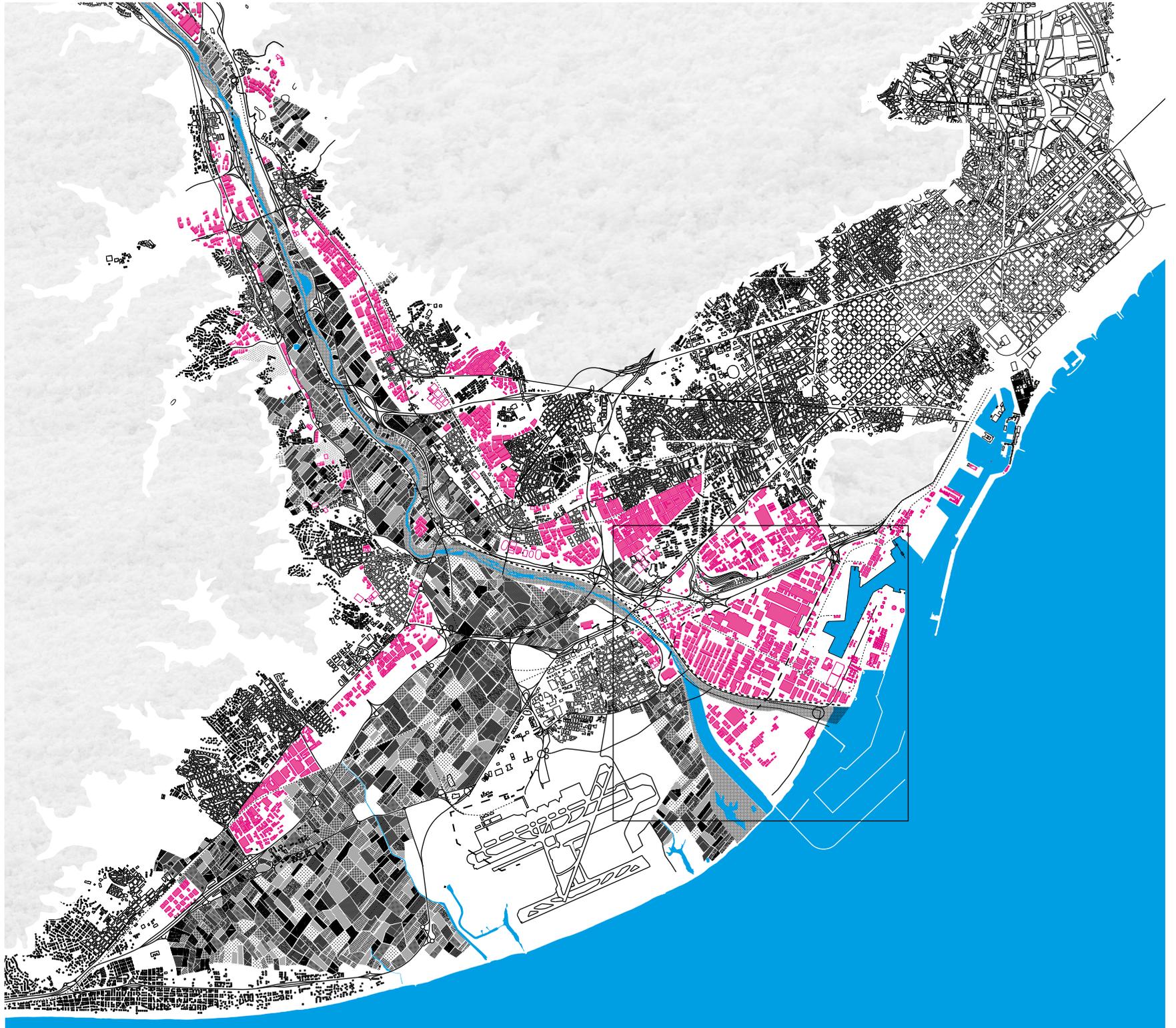


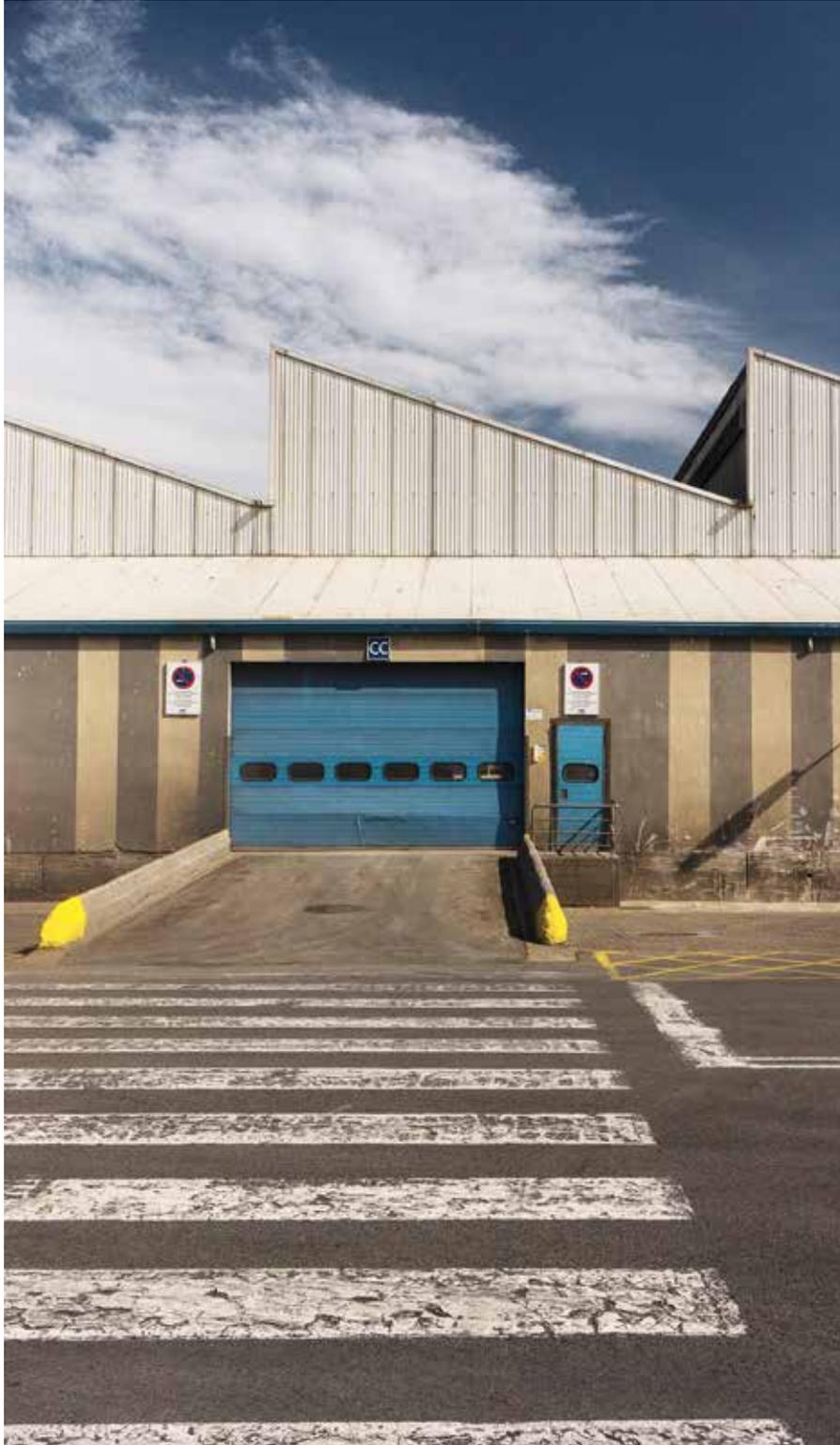
> **Transport**

Pedestrian / Public
mobility
Car mobility
Train mobility



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UPCYCLING ZONA FRANCA

Carles Crosas & Jorge Perea

The Zona Franca Industrial Estate is the largest and most active industrial area in Spain and one of the most dynamic in Europe. It has been a key factor in Barcelona's economic strength since its construction in the 1950s and it has tremendous future potential. Covering an area of about 600 ha, over 300 companies operate in the Zona Franca, employing more than 50,000 workers. Together with the harbour and the new ZAL (logistic activity area), it encompasses a high volume of trade and goods, representing around 3% of Spain's gross domestic product.

The Zona Franca took off when the decision was made in the late 1940s by the Spanish dictatorship to locate the SEAT factory (Spanish Society of Automobiles and Transport) here in an attempt to modernize the country's backward economy. That decision turned out to be crucial for the future of the city of Barcelona, for the surrounding region (especially the *comarca* of Baix Llobregat) and, in economic terms, for the whole country. As a result, the Zona Franca from that moment on was the embodiment of economic and productive progress.

Its geographical location provides the Zona Franca with excellent potential: sited in the Delta plain of the Llobregat River, it is separated from the city centre by Montjuïc, a prominent hill that pushes the area into the hinterland. Nevertheless, the core of the Zona Franca is only 7 km away from the airport and the same distance from the city centre, an attractive aspect in terms of leisure and services. In the 1990s the construction of Barcelona's ring roads (Rondas)

linked the local traffic up with the national highway system and provided the area with two specific points of access. Very recently the Zona Franca was connected to the high-speed railway system, adding a final element in the configuration of a superb network of international connections.

The high degree of infrastructure provides excellent accessibility and strong interdependencies with the metropolitan area, but in spatial terms it reinforces its specialized character and functional organization. Gates, loops and segregated types of infrastructure make up a system of progressive enclosures, with delimited areas and few synergies nearby. Historically, this enclosed character is closely associated with tax redemptions and fiscal advantages as 'Zona Franca' means Duty Free Zone: an area that is 'isolated', and protected by special regulations.

Separated by a thin but continuous fence, both the Zona Franca and the harbour are areas of 'public' land whose administration is managed by public consortiums. The *Consorti de la Zona Franca* is run by the Central Spanish Administration and the City Hall, Barcelona's Port Authority, and the Generalitat de Catalunya (regional government). This structure means that these public consortiums operate both as landlords and managers, administrating areas for logistics, industry and manufacturing. Decision making on the kinds of infrastructure for supporting new industries, real-estate policies and the type of businesses are their specific responsibility.

The harbour and Zona Franca areas play an active role in the metropolitan metabolism because of the concentration of different types of infrastructure they host: eco-park (city waste), a general sewerage collector, a large water-treatment plant, a gas pipeline from north Africa and other fluids. Most of these different forms of infrastructure are under-used in terms of capacity and could serve a wider area.

In recent years, the industrial estate has undergone major changes: new projects have replaced older industrial activities with more innovative companies, which seek to

optimize their location, thus introducing added value to the city. The huge SEAT complex (initially covering more than 150 ha) is no longer fully active and the old buildings have been transformed into new vacant plots (BZ sector). Meanwhile the large central market Mercabarna is one of the most active clusters, serving a population of almost 10 million inhabitants. Logistic activities take advantage of the Zona Franca's accessibility and new projects are planned to attract added-value activities including R+D and pharmaceutical companies.

This upcycling process requires services to be more strongly structured. Hence the infrastructure projects that reinforce the accessibility of both the harbour and Zona Franca: new railway tracks connecting with the European rail network, new terminals for containers at the harbour and the future plans for the Ronda Litoral motorway. At the same time, new businesses demand more qualitative urban services that consider environmental factors as added value. New networks for heating and cooling, as well as use of the cold surplus from the regasification plant are to be implemented. Including these in the design and production of industrial models, and in specific clusters and forms of hybrid urbanism will be a great challenge.

The future scenarios for this area offer enormous scope, because of its geographical qualities, infrastructure assets and the new energy resource options. The diversification of economies and changes in industrial forms offer a wider range of possibilities for making the best use of the Zona Franca's excellent location. Additionally, the presence of two new metro lines (one crossing the area to the airport) with six metro stops opens up new opportunities: we can imagine a more intense and diverse scenario, achieving a definitive break in patterns of isolation with regard to the city.

Within this general framework certain questions arise. How we can imagine here a new balance between the local and global economies? Is it possible to imagine that local flows, based on a regional-scale economy, could progressively

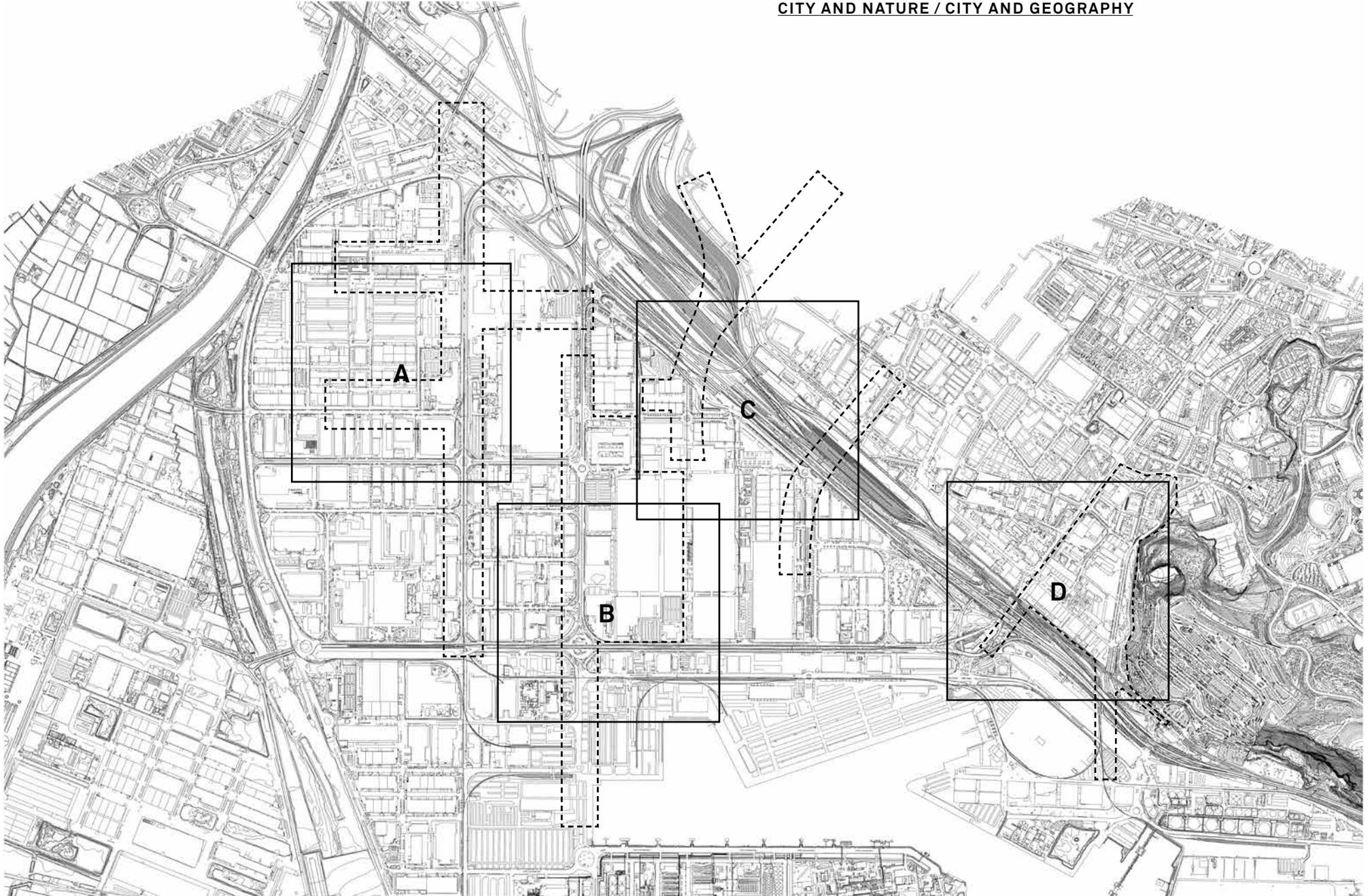
replace the global ones? In a prosperous future, what kind of activities could be in-filled to intensify this area without displacing, again, the productive economy to the outskirts of the city? What lessons from the 22@ District experience could be transplanted to this area with its completely different structure and location? And in the near future, what kind of progressive strategies could be implemented, launching temporary initiatives to overcome the economic gloom forecast for the coming years?

To address these questions, four different sites (A, B, C, D) were chosen according to their potential for exploring the creation of new energy networks, and for overcoming the sense of enclosure in Zona Franca by stimulating potential synergies with future industries and the tertiary sector. Varying from existing mixed fabrics and strong logistic parts to ex-novo implementations, from linear elements to grid-like patterns, the sites allow a deeper exploration of the typological and urban approach to these networks. For instance, the appearance of taxi cooperatives based on solar cell parking lots exemplifies how energy logistics might be implemented not only at the design level, but also at the social level.



PROPOSALS

- A. MERCABARNA: MORE THAN FOOD**
- B. BZ AREA: AFTER 'RESET' OUTSTANDING AREA**
- C. TRIGENERATION PLANT – HEATING AND COOLING DISTRICT
CROSSING THE RAILTRACKS – CENTRAL AVENUE**
- D. ZONA FRANCA TROROUGHFARE.
CITY AND NATURE / CITY AND GEOGRAPHY**



SITE A MERCABARNA: MORE THAN FOOD

Mercabarna, Barcelona's fresh food market, is characterized by its disorderly operation within a fenced context: its functional isolation contrasts strongly with the massive daily influx of workers, visitors and traders. On the one hand, the growth of the market, traditionally based on programmatic densification and complementarities, has now evolved into the complexity of a small city, requiring room for services and more diverse program: vacant spaces, boundaries, friction between spaces have become the subject of possible urban scenarios. On the other hand, the fluctuations of people and activities in time, with peak moments in the early morning and lower presence in the afternoon, open up the possibility of reconsidering the role of some areas, as more hybrid spaces.

The upgrading of energy networks, the new metro line and new connections in the north form the context within which to examine possible ways for Mercabarna to intensify, with the expectation of new forms of urban life coexisting with the logistic program.

TUTORS

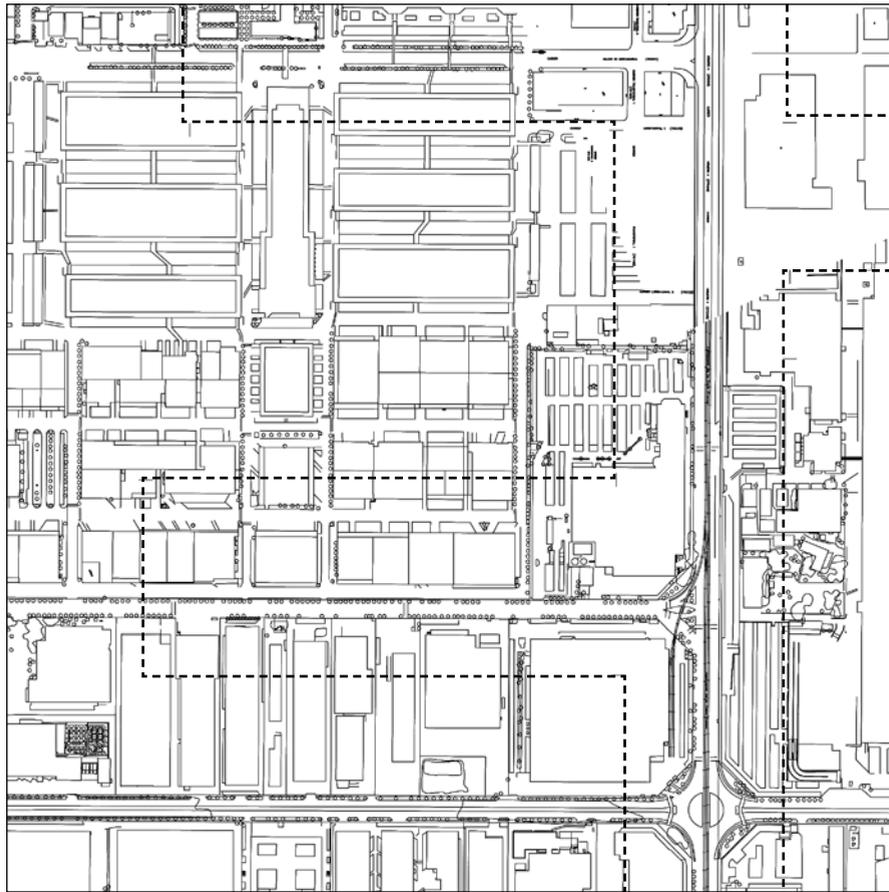
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Chantal Marfa Barril
Elise Tonglet

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Matthias Mazelier
Koen Merken
Aurèle Rattez



THE LANDSCAPES OF FOOD: SYNERGIES AND REGENERATION

Andrea Bortolotti, Samuel Llovet & Cristina Renzoti

Dealing with flows in a site like Mercabarna – Barcelona’s main food market – means addressing the daily production and consumption of food. The site is a nodal logistic and wholesale point of importance for the whole of Catalunya. The market provides products from four main sectors for a large number of consumers: fish, fruit and vegetables, flowers and meat. Facilities and machinery are present for the storage (warehouses), conservation (cold stores) and transformation (slaughterhouses) of fresh goods. Currently, Mercabarna functions as a kind of island totally devoted to food distribution and logistics. The whole area, indeed, is encapsulated by a heavy transportation system that encircles the site, thus creating enclave-like conditions that current trends are likely to reinforce: the forecast for the harbour is that its traffic will concentrate and double, transforming the former Llobregat river into a new infrastructure corridor.

Despite this, current global and local economic trends are creating pressure to change Mercabarna’s enclave status and mono-functional character, so that it opens up its sphere of influence and becomes more attractive to the surrounding areas of the Zona Franca and the metropolitan region.

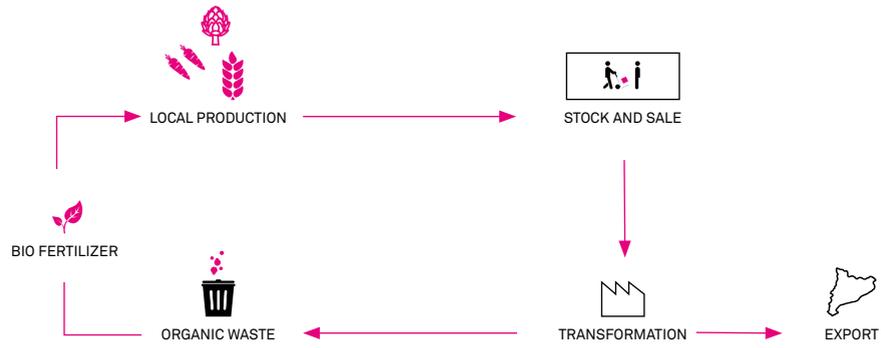
Because of its position, role and function, the site provides an opportunity to deal with some important issues, in particular concerning the role that food production and distribution might play at

different scales. First, its specific location on the lower reaches of the Llobregat river means it can be conceived of as part of a wider system of industrial platforms located along the river, connected with the valley and its various kinds of infrastructure. This productive pattern coexists with a large protected area, the Parc Agrari del Baix Llobregat, established to preserve the residual agricultural spaces, in a patchwork with industrial and urban areas.

Second, on a smaller scale, one of the main questions that emerge when considering Mercabarna is how to deal with increasing complexity and improve the efficiency of this specialized part of the Zona Franca. Factors include the huge number of users (around 2000 workers in the Central Market of Fruit and Vegetables alone, over 5000 customers daily, distributors, tertiary sector employers, etc.) on the one hand, and the enormous challenge and potential that food distribution and food waste pose on the other.

Could closer spatial relations between the Llobregat river and Mercabarna help enhance synergy between local food production and food distribution? Could Mercabarna then become more attractive to new actors, not only producers, but also consumers from Barcelona and the Zona Franca? The reflections on the first project provide a broader look at the variety of landscapes of this metropolitan area: heavy infrastructure and industrial platforms, but also spaces for spontane-

ous vegetation and informal uses (along the banks of the Llobregat), recreational areas and sports facilities. The reflections on the second project provide a closer look at the mono-functional character of



the site, using some of the recurring conditions of the industrial and logistic areas to conceptualize possible new assets of spaces and activities.



GROUP 1:
**BRIDGING LANDSCAPES:
 LOCAL FOOD PRODUCTION
 AND SALE**

The pattern of production can be visualized as bridging the two landscapes involved: the industrial and the agricultural. From this perspective, the environmental and landscape infrastructures could be integrated at the borders of the hard platforms, thus enhancing the interlinking of flows between these areas and the surrounding region. The industrial areas should manage rain and wastewater carefully, so that the water released into the river is of good quality. The productivity of agricultural activities, could be improved by diversifying the crops grown and using linear vegetation structures to grow biomass in the form of trees or grasses, which would at the same time reinforce the buffer zone for water retention and purification along the river and canals, while maintaining the connections between the two landscapes. In Mercabarna, organic waste management could be fostered by transforming organic waste into fertilizer for the agricultural park. Moreover, the site could further improve its logistic functions by focusing on the distribution of local fresh food, thus imparting new promotional and selling functions to the productive landscape of the river valley. These ideas form the basis for a different local economic infrastructure, consisting of alternative mobility routes both for goods and people, where the existing regional transport system could provide a background of connections at different speed throughout the area.

**EQUIPPING MERCABARNA:
 RECYCLING WATER, ENERGY AND FOOD**

Attracting new functions and people requires careful implementation of activities, facilities and practices. First, it means addressing issues of time and uses, as the opportunities and potentials of the existing functions are likely to be intensified. This led us to imagine new activities and facilities distributed over the existing ground floor level and a new, superimposed floor, drawing more people to experience the food production processes, with a particular focus on the potential use of hot and cold energy waste streams for food conservation. This would however require rethinking of spatial hierarchies, reinforcing existing spatial assets and introducing new ones. The main idea has been to induce a diversity of activities and functions along the border of the area and along the main internal axis, connecting the Zona Franca main service axis with the planned new metro at the edge of the market. One idea is to do something about the large amount of organic waste produced within the area by introducing recycling activities in the food production sector, starting with leftover food. Another idea is to provide the market with all the equipment and facilities needed for its new functions of processing and displaying foods, as well as for receiving and accommodating more people and activities.

CONNECTING MERCABARNA: LOGISTICS AND SPACE OPTIMIZATION

Considering the receptive nature of the area and its attraction potential, we decided to intervene by redeveloping in a way that would guarantee and improve the presence of specific food-related services and facilities in the area. The intervention focuses on conserving the existing nature and functionality of the site, improving its accessibility from public transport services running between the city centre and the airport, re-defining the existing fence and adding activity to transform Mercabarna into a new magnet.

The infrastructure in this case becomes the backbone of the project. New traffic provisions, public transport lines and pedestrian access points would transform the Carrer A and the Carrer Quatre into productive and urban components leading to Mercabarna, clearly connecting it with its surroundings and transforming this axis into a place of interest for further commercial development. The large green spaces around the river would be redefined, from agricultural buffer zone to a regional park and recreation zone, partially underneath the new planned infrastructure.

An important element blocking overall access to Mercabarna is the physical fence surrounding the site, which leaves no opportunity for different usage scenarios. For this reason we developed the idea of concentrating the existing scattered parking spaces, which use up a lot of space, into three strategically placed car parks. This would liberate horizontal space at ground level, allowing internal traffic flows to be altered and making the soil permeable. The space gained by these interventions would mainly be in the central area, the Carrer Major, which would become a public space that could be used for different purposes according to the time of the day, week or season. For example, during afternoons and weekends, when no distribution is happening on the site, a food market could be organized, where people can buy small quantities for a reasonable price directly from the distributors, hereby creating a direct link between the inhabitants and the market.

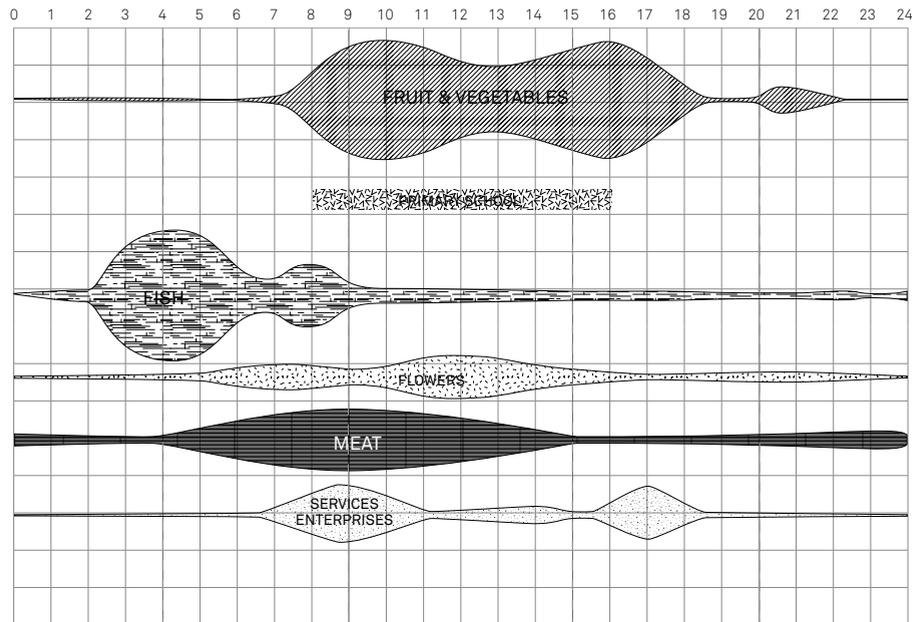
Because of the limited possibilities for extending the ground space that Mercabarna covers, the market needs to pursue alternative growth strategies. We chose to focus on vertical densification. By adding extra levels to the existing buildings, a new layer of activity could be added. Whereas at present the site is purely a location for storage and distribution, we imagined the possibility of also offering forms of food processing (using food that otherwise would go to waste for making soup, marmalade or other products), gastronomic food preparation (in the form of restaurants or cooking lessons) and of energy recycling between the different operations, as well as through solar panels, green roofs and water purification systems.

— Ferran Iglesias Secured, Louise Lauwers, Leonoor Leus, S  phora Loiaiza-Zuluaga, Chantal Marfa Barril, Elise Tonglet

 25.000 WORKERS

 800.000 TRUCKS / YEAR

 1.845.550 CARS / YEAR



 25.000 WORKERS

 1.000 EXTRA WORKERS

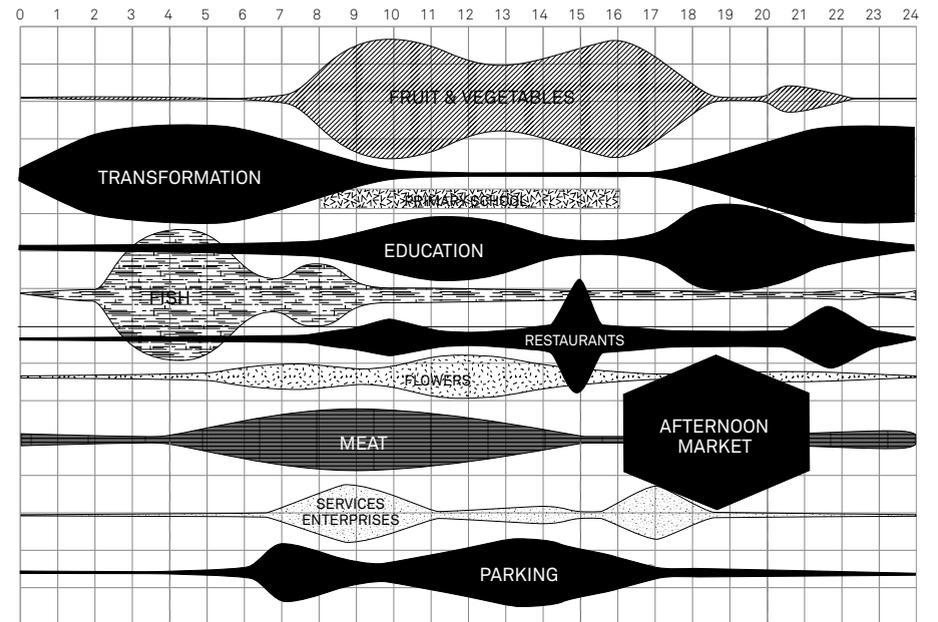
 700 EXTRA STUDENTS

 800.000 TRUCKS / YEAR

 1.845.550 CARS / YEAR

 9.000 RELOCATES PARKING PLACES

 5.000 EXTRA CONSUMERS



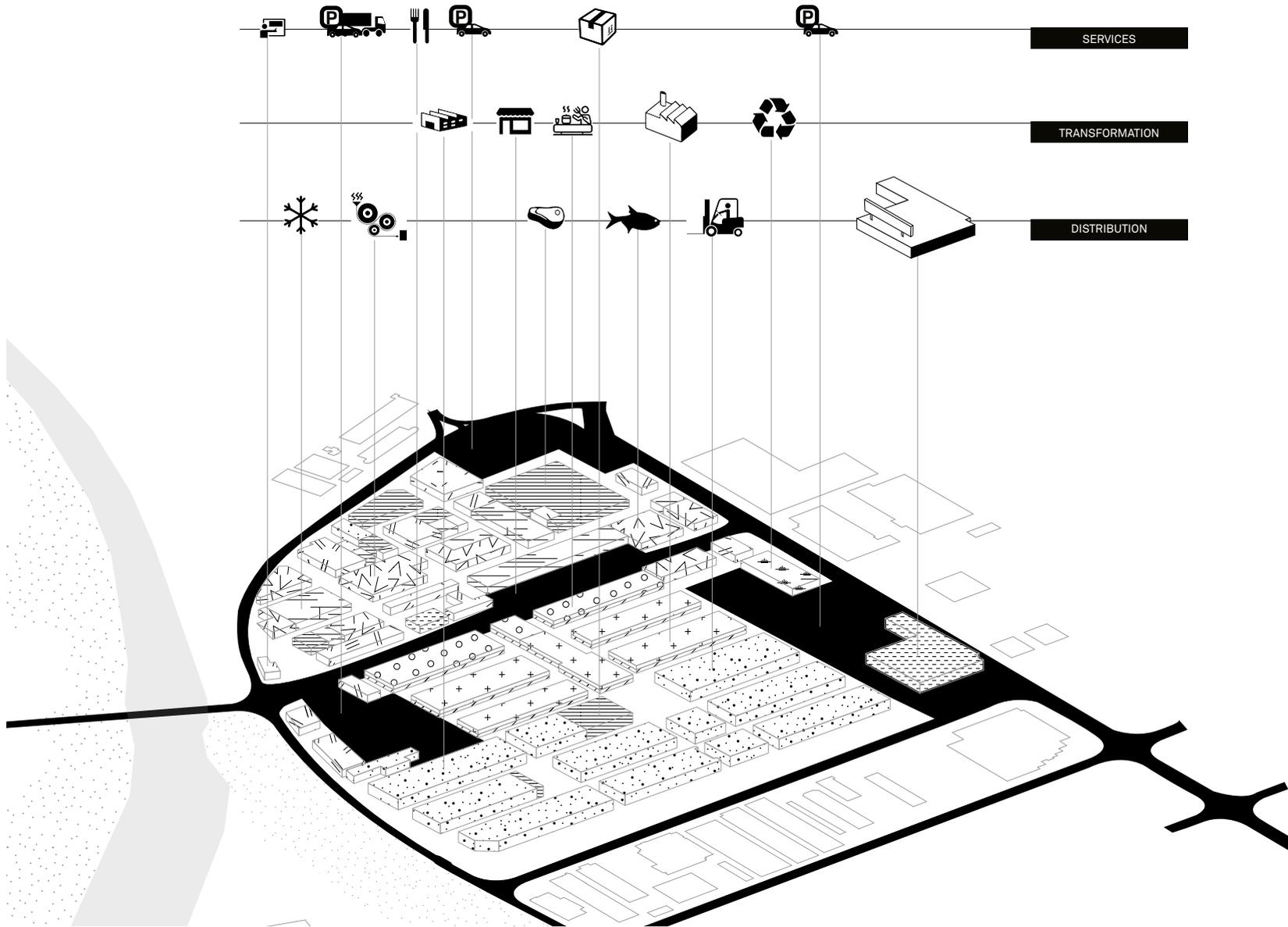
Time management

Multiple actors define the current functionality of Mercabarna. Time management is an important tool to harmonize the different uses.



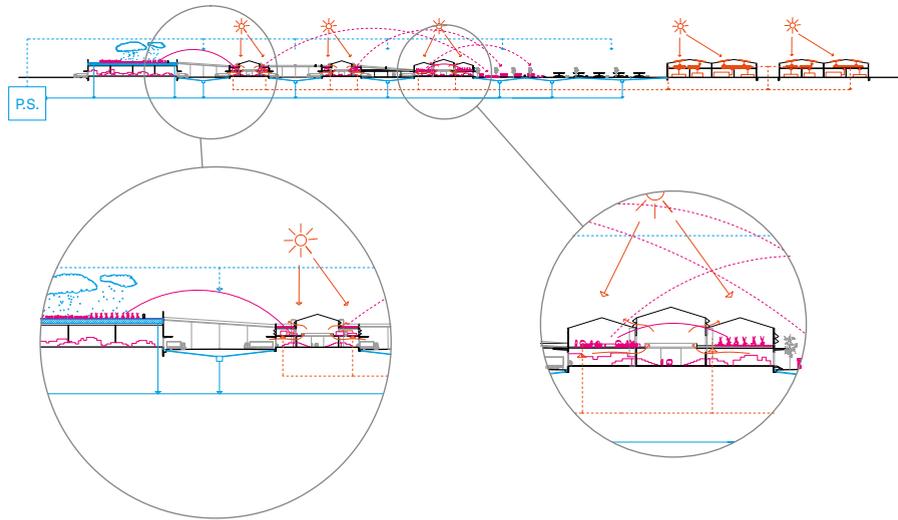
Connecting the market

The connection of a new metro and tramline to the market will lead to an increase in the number of users, the accessibility of the site and its role as the main distribution centre for several markets in the metropolitan area of Barcelona.



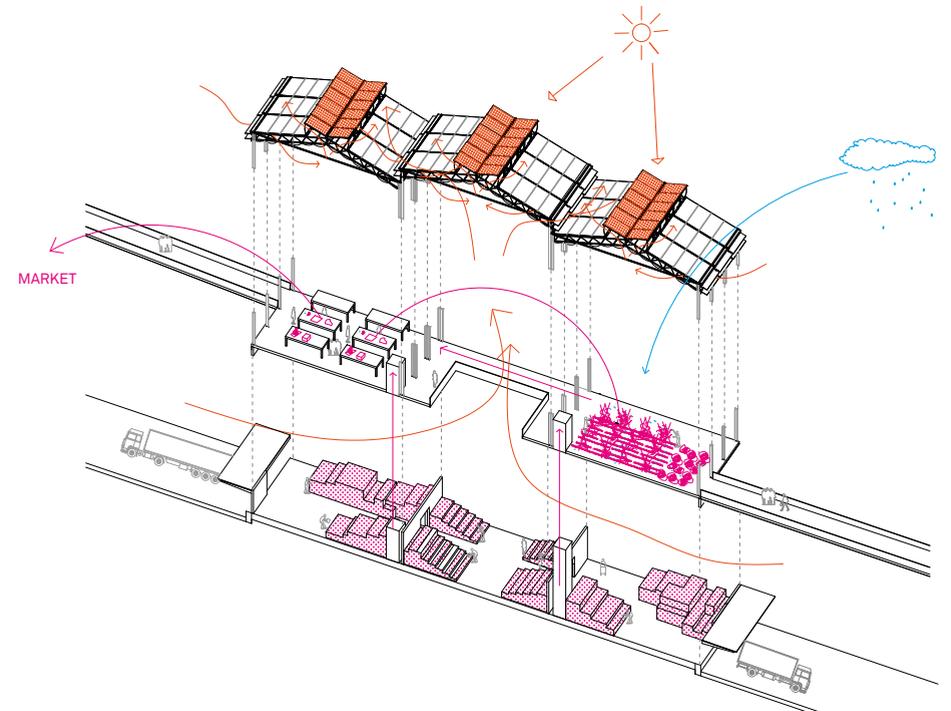
Activity planning

An important way of achieving efficient planning of activities and uses is achieved through the strategic location of facilities and processing plant on the Mercabarna site.



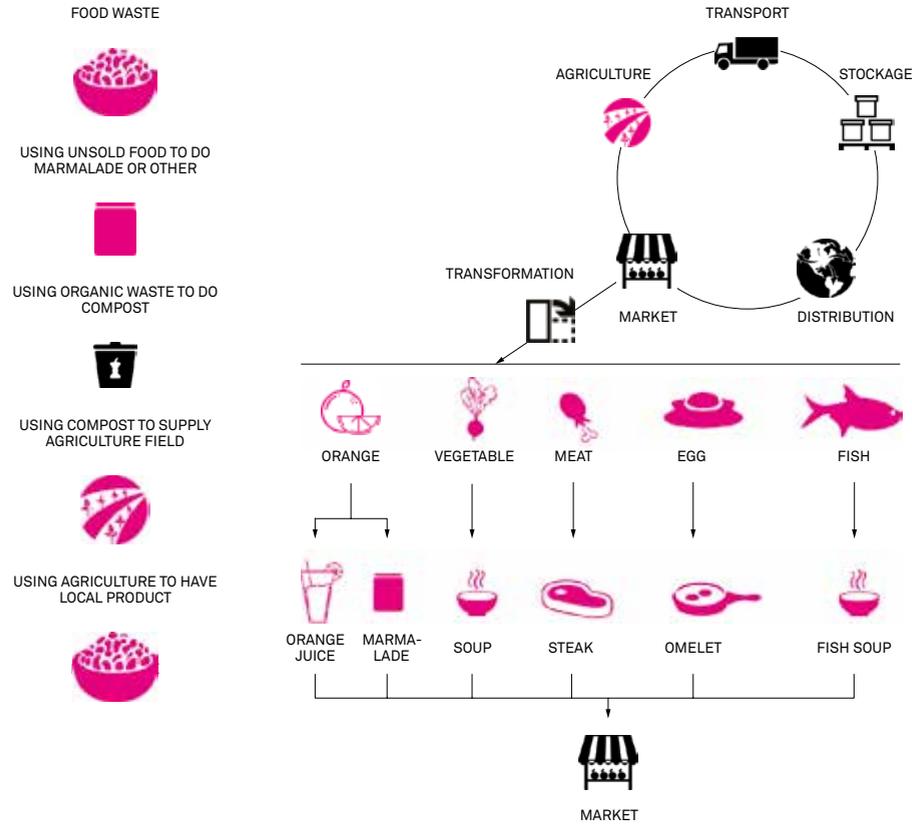
Intensification of uses

By means of superimposition of different activities, the market becomes a new centrality, merging economic-oriented activities and public-oriented programmes with recycling strategies.

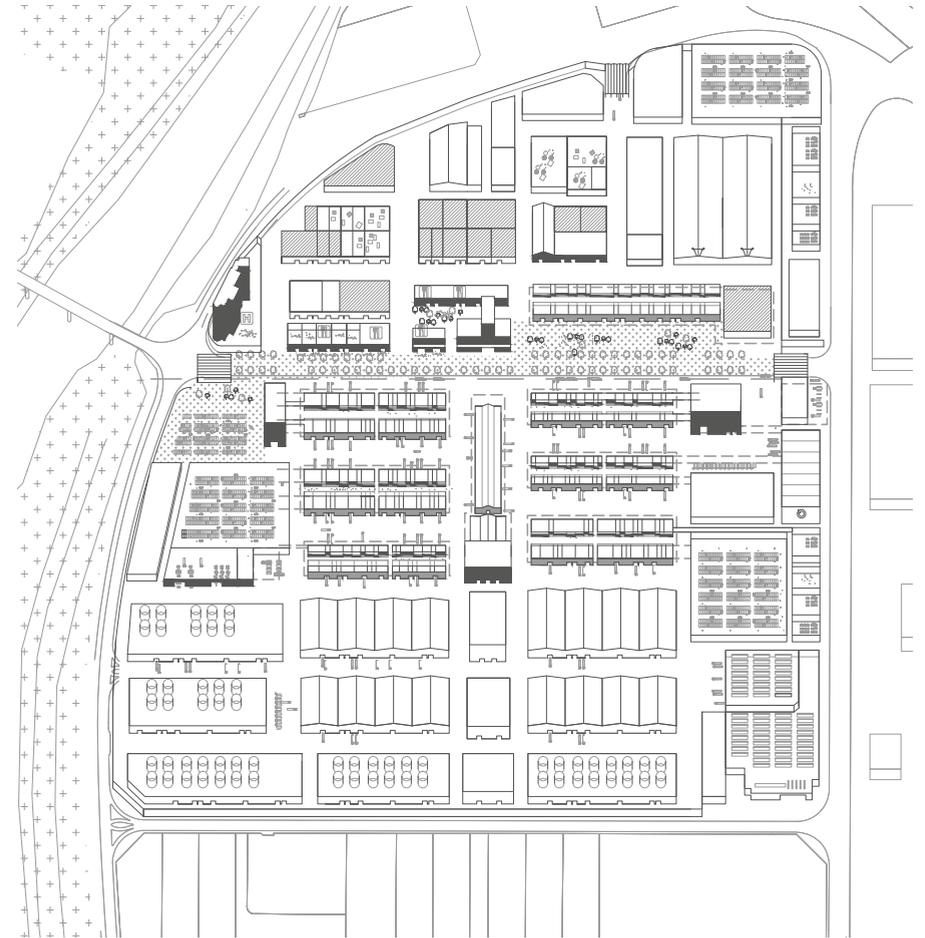


Energy and water cycles

Solar panels, green roofs and water purification systems are sited on the large areas of rooftop in order to produce energy and recycle water in the entire Mercabarna area.



On-site production
Food waste is limited by creating organic waste processing on site.



Equipping and connecting Mercabarna
Recycling of water, energy and food and optimizing logistics enables the urban spaces of Mercabarna to be revitalized.

GROUP 2:
**LLOBREGAT INTEGRATED
CORRIDOR**

The Llobregat River is one of the main rivers crossing Catalonia from north to south that flows into the sea in the delta located on the west of Barcelona. Infrastructure and industry have been developed along the natural system of the river. This system, which vertically connects industries and dwellings, has also created borders between the natural and agricultural patterns. The project intends to create a potentially heterogeneous structure. Connecting patterns around the ecosystem of the river would create an opportunity for combining the existing elements and integrating larger forms of infrastructure (for the local economy, industry and dwellings) into a more regional system.

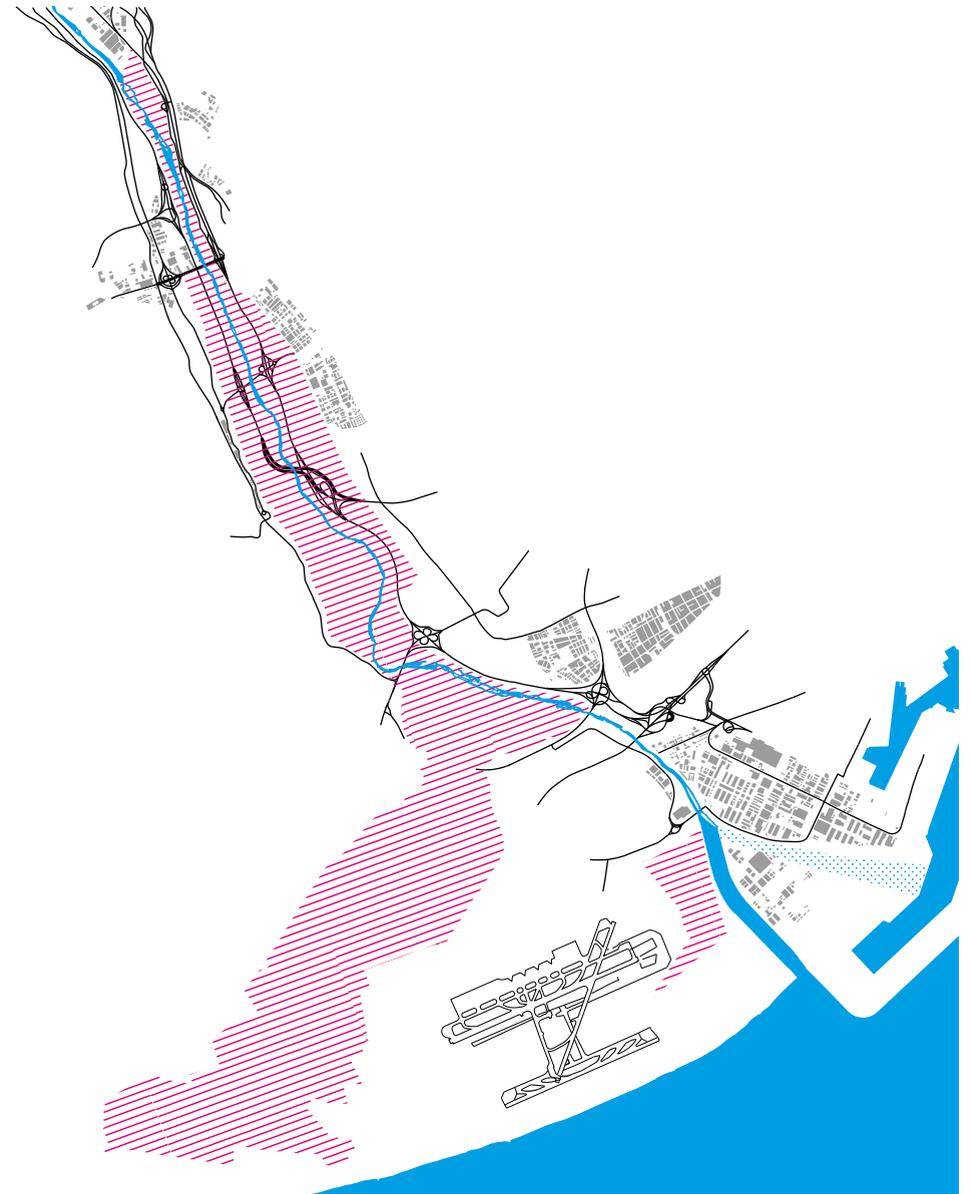
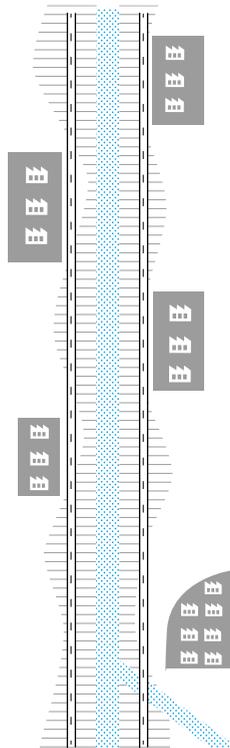
Mercabarna is situated at the endpoint of the whole system. At the intersection of different traffic flows, which potentially connect the valley, the harbour, the centre of Barcelona, the airport and the surrounding residential areas, it occupies a central position within the region. This location also gives Mercabarna strong potential as a logistic centre, which could sustain the productive economy of the valley by making use of the existing infrastructure. In a scenario that includes renovating the existing railway lines, accepting the highway and continuing the metro city project, the necessity of a multimodal solution – managing and distributing the different inflows from the entire region – became clear.

The convergence of the new and old branches of the river creates the strategic space to integrate transportation and the natural river system. This forms a framework for the design intentions, offering an opportunity for Mercabarna to become the logistic centre of a much larger regional area.

Polluted water from surrounding structures will be treated by phytofiltration in the river wetlands. At the same time, this process will permit biomass production along a linear park, combining low-level infrastructure and creating valuable local impacts.

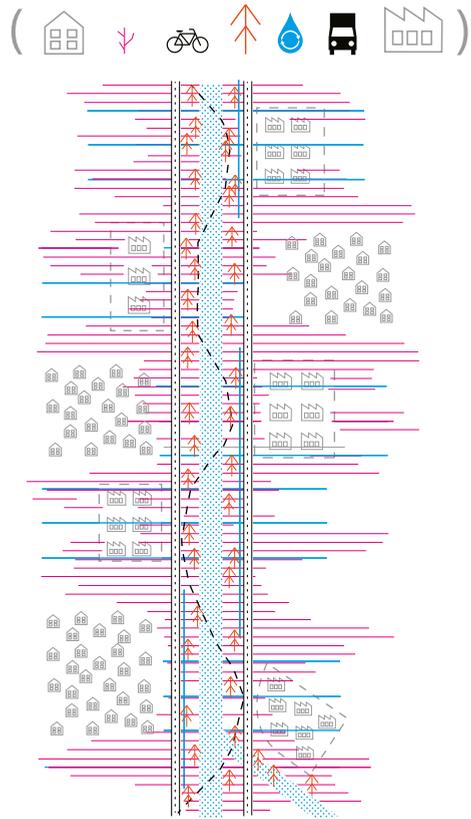
Finally the project would also enable public facilities such as an educational centre, restaurants, and markets with their logistics program, to form an integrated whole, transforming the area into an accessible incubator for new initiatives and an educational example for future sustainable industries.

— Davide Del Favero, Cristina Di Francia, Camille Gardien, Ludovica Imperato,
Matthias Mazelier, Koen Merken, Aurèle Rattez

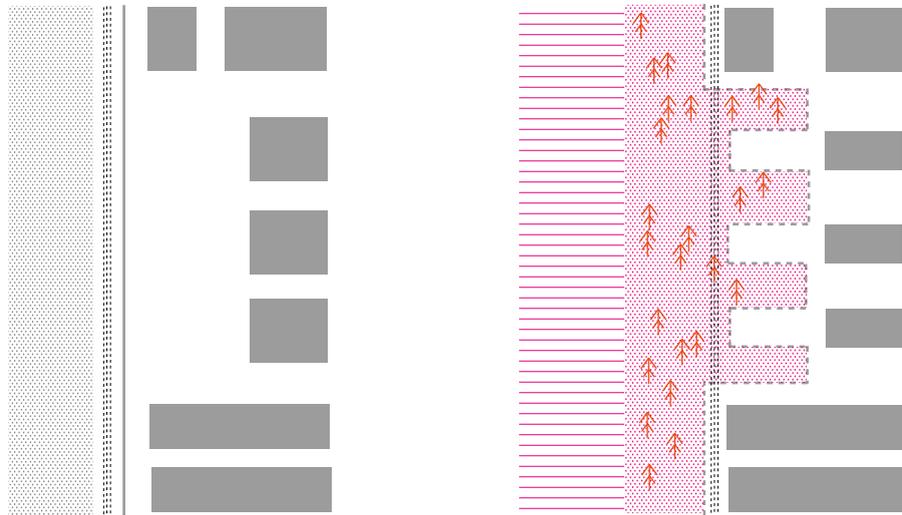


Llobregat river corridor

The river bed is a complex and heterogenous landscape of industry & urban fabric (grey), agricultural land (magenta) and transport infrastructure (black).

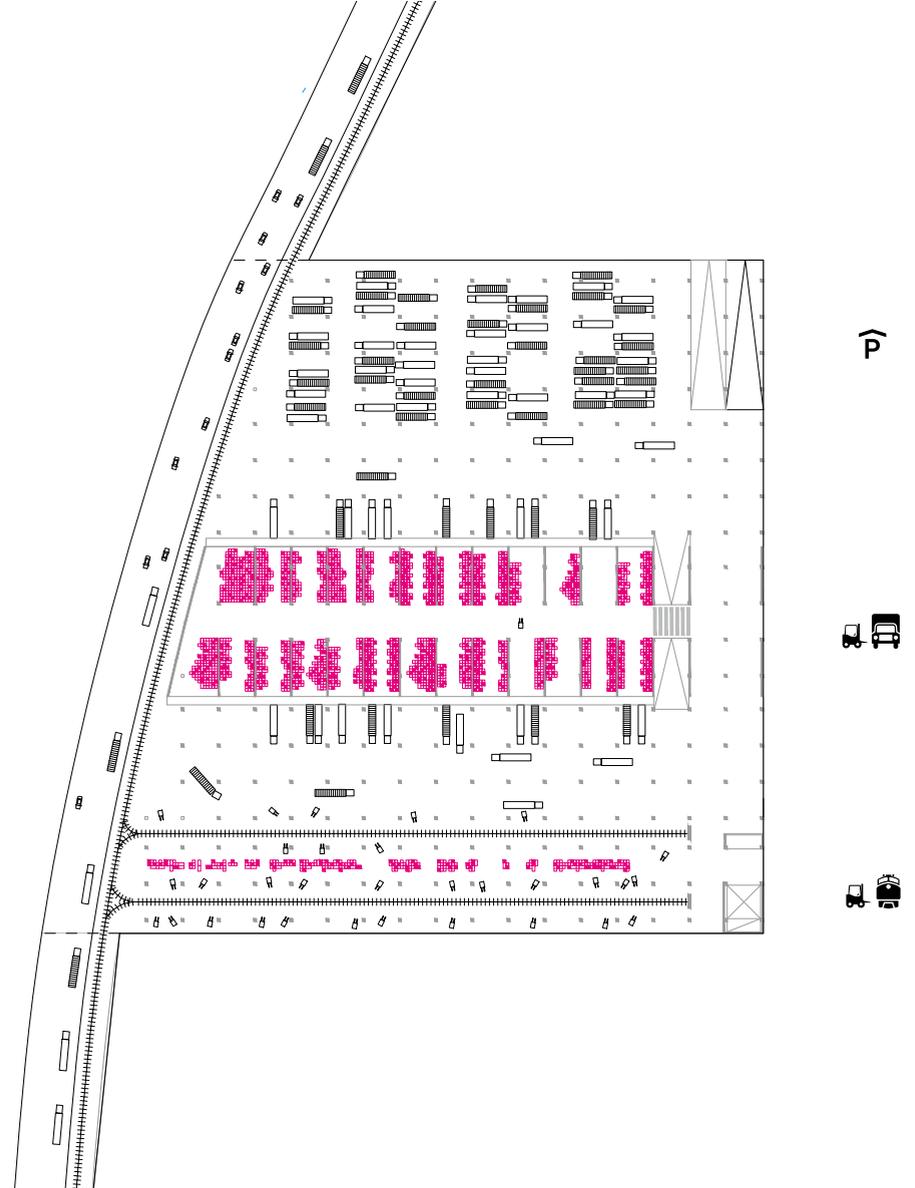


Integrated corridor project
Combining existing elements and integrating surrounding infrastructure into a regional comprehensive system.



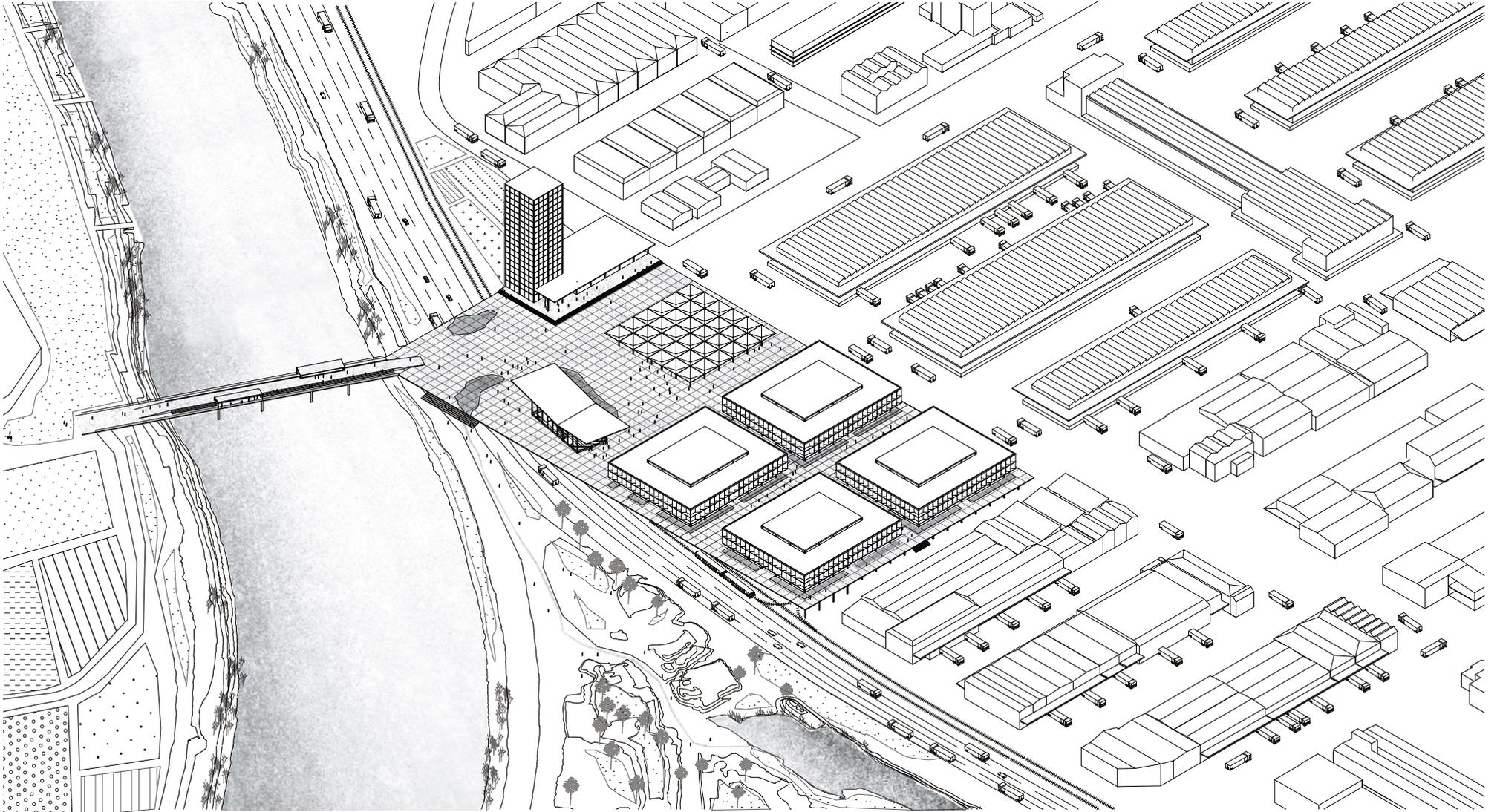
Mercabarna's strategic position

Mercabarna is located downstream on the Llobregat river at the intersection of agricultural land, transport infrastructure, industry and logistics.



Logistics basement

The basement under the platform connects the railway and highway, and structural inflows and outflows.



Multimodal platform project

A pedestrian platform at the entrance to Mercabarna acts as a public space that is open to the surrounding landscape. Project development after the intensive program by Camille Gardien, Matthias Mazelier and Aurèle Rattez.

SITE B BZ AREA 'AFTER RESET'

At the core of the Zona Franca, the SEAT factories have made way for the Barcelona Zone innovation project, BZ. The wish to diversify the industrial model of the area led to an attempt to stimulate a mix of traditional manufacturing industries with audio-visual and cultural enterprises, biomedical and food-based services, but today the area remains underdeveloped. Nevertheless, major questions continue to be raised in discussions on the industrial model and the site as a key opportunity for wider (logistic) programs in the city.

Besides this, the heavily used thoroughfare Carrer Tres provides the link between the harbour entrances at the south and the Ronda Litoral accesses, the Consorci Offices and the residential district of Bellvitge to the north. The metro line to the south of the BZ will soon become operational, and a new metro line is planned to the north.

The added potential of the re-gasification plant at the harbour, which is directly linked to Carrer Tres, as well as the recently constructed tri-generation plant, may result in new potential approaches to the future of the BZ district, as energy networks might become a key and competitive factor to stimulate programmatic devices. Shared spaces, services and networks are becoming strategic parameters in the wider discussion.

TUTORS

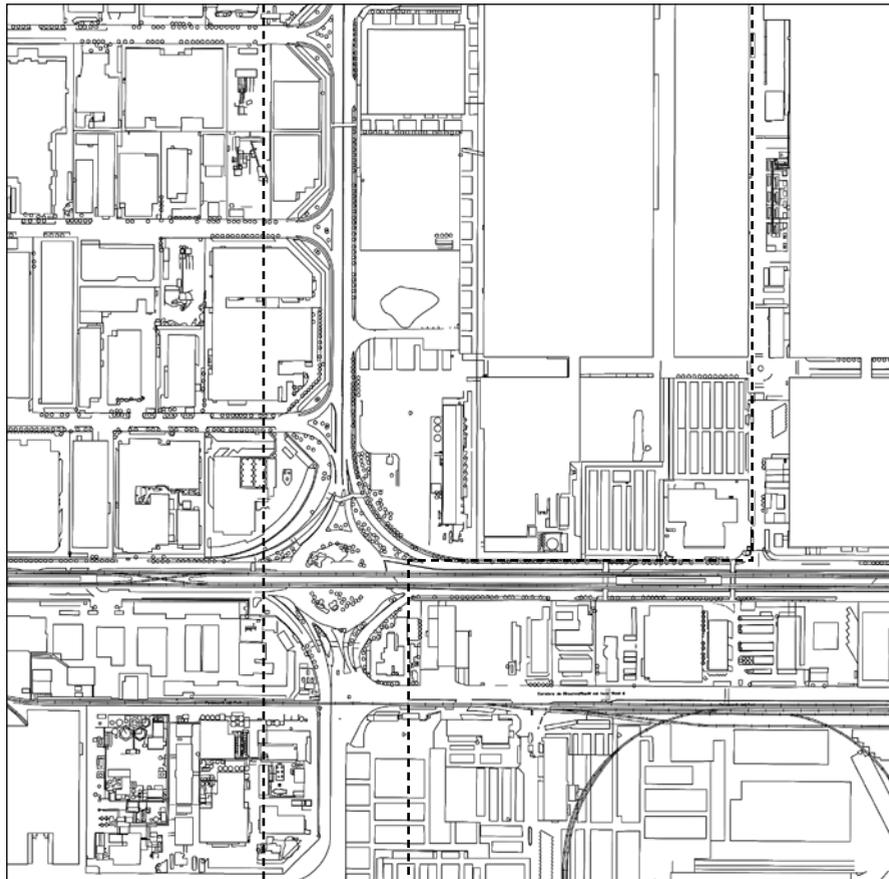
Geoffrey Grulois
Jens Aerts
Chiara Tosi

GROUP 1

Andrès Bellera
Enrico Bivi, Julia Gallardo
Antoine Horenbeek
Engy Khaled
Filippo Marchiori
Fernando Montoya
Martinez
Laura Rijsbosch

GROUP 2

Sarah Avni
Céline Foubert
Stefano Teker
Luis Bellera Fernandez
De La Cruz
Vittorio Salvadori
Matteo Vianello
Alessio Milan
Kristien Van den Houte



THE SPATIAL ECONOMY OF MATERIAL CYCLES

Geoffrey Grulois

While intense material and economic flows (food, cars, heavy traffic, etc.) cross sites A, C and D, the students and tutors working on site B were left with a huge empty plot, which bears witness to the offshoring of the car industry. The Seat manufacturing plant, built in the Zona Franca in the 1950s, was the symbol of post-war industrial development around the modern harbour. Today the 50-hectare empty plot left by the demolition of this plant attests to the uncertainty surrounding the economic future of the Zona Franca. How can an old industrial area located at the periphery of a European metropolis survive the process of industrial offshoring? This is the fundamental question posed by site B, as the economic crisis has slowed down the ambitious BZ reconversion plan.

Both groups decided to use this state of uncertainty as their starting point for the project. How can we rethink urban design in this state of economic uncertainty? How can we use urban metabolism as a catalyst for urban redevelopment? How can we create flexible, co-generative and sustainable design strategies that will breathe new life into the site? These are the key questions addressed by the two projects.

Both groups approached the future of the vacant plot through the lens of its metabolic context. The first group investigated its interrelation with Carrer A, which draws a boundary between the Zona Franca and the industrial harbour.

Indeed, the recent construction of an elevated metro connecting the Zona Franca with the city of Barcelona and the airport re-emphasizes the structural role of this large thoroughfare. In order to go beyond the logic of transport, the group investigated how Carrer A could become an interactive spine for upcycling economic and traffic flows between the port and the Zona Franca. Four main potential interactions were identified: first the exchange of food and waste between Mercabarna and the cruise port located to the north-east, second the use of intense cold resulting from the process of vaporization of liquid gas stored in the port, third the use of the potassium extracted in Catalonia and stored in the harbour. The fourth interaction concerns the use of this potassium as a local fertilizer component for nearby agricultural area in combination with the organic waste of Mercabarna (potential compost).

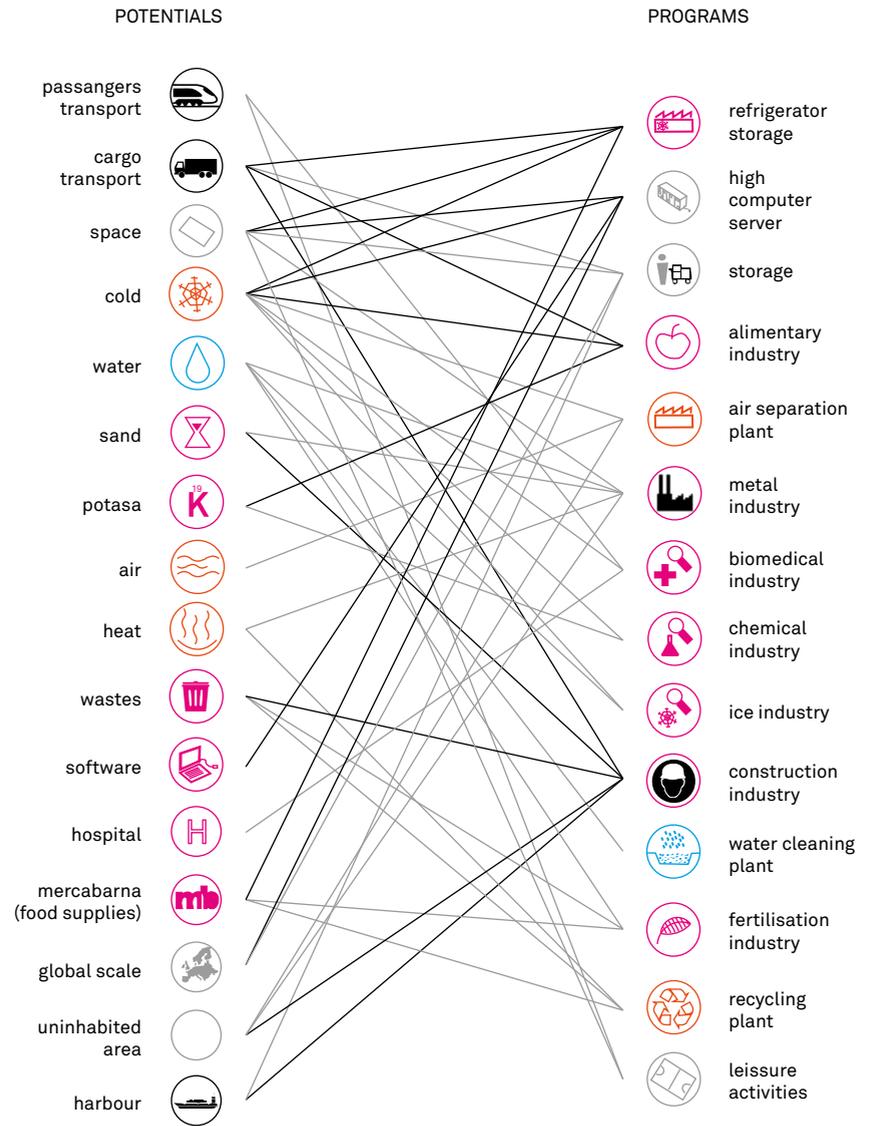
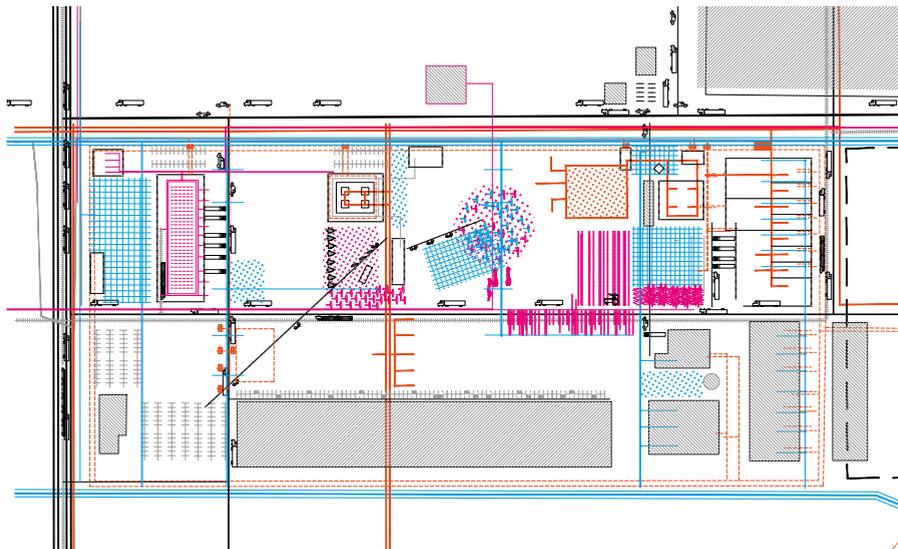
All these interactions point toward potential scenarios of programmatic clustering and spatial development along Carrer A. In order to reveal potential cluster development on the site of the former Seat plant, the group considered the transformation of Carrer A into an interface between industrial and logistic activity on the port side and wholesale and economic activity on the Zona Franca side. An example of development sustained by local flows would be a cluster related to an agricultural and garden centre,

taking advantage of the potassium and compost presence. This cluster could attract bio-chemical companies interested in the potential use of local resources such as nutrient waste and potassium. The second example is a sports cluster to be developed around a Decathlon store combined with a ski dome, taking advantage of the presence of intense cold in the port. Around this cluster we can envisage the development of a workshop for upcycling waste material into sustainable goods such as bicycles.

The second project investigated the possibilities for turning the Seat plot into an upcycling incubator. Taking into account the fact that it seems difficult to attract large-scale investment in new materials, due to the economic crisis, the group explored the potential of material flow and networks located around the site to trigger redevelopment. Both the infrastructural grids and local resources are seen as a means to create economic and spatial value for the empty plot. A detailed study of the site constraints (soil and noise pollution, infrastructures)

and the material available led to the identification of a number of potential programmatic and spatial developments. Among these, the group further explored the establishment of a food-processing cluster, a data centre connected to IT companies, and a logistic hub. The new eco-industrial know-how of these clusters would be grounded in the metabolic opportunities offered by the area, thus enabling the transformation of the global industry of deterritorialized large-scale flows (transport of raw materials and consumer goods) into local small-scale eco-industries.

Together these two projects exemplify how a spatial economy of material cycles that links the field of industrial ecology with that of urban design could be brought into operation. Urban metabolism becomes a strategic tool to define a new ecosystemic approach to urbanism. The study of both visible (transport, etc.) and hidden (pipes, etc.) material flows and networks around the site is the starting point for imagining new spatial agencies embedded in an uncertain, yet sustainable future.



GROUP 1:
UPCYCLING INCUBATOR

What does the future hold for Zona Franca during or after the crisis? What kind of framework can support the site's new developments? How will it evolve over time and what kind of spatial elements will stimulate this evolution?

The Zona Franca industrial area is characterized by heavy industry and small companies. It is well located in terms of transportation: the harbour provides a global connection, as do the nearby airport and extensive railway infrastructure. Moreover, in the near future a metro line will connect the area with the city of Barcelona.

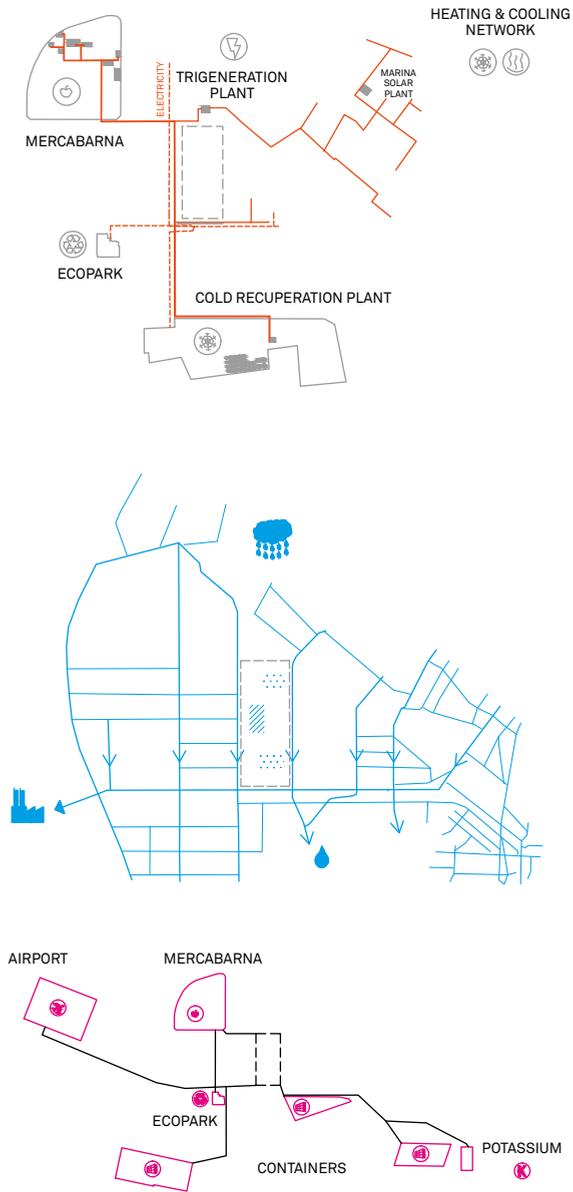
Due to the economic crisis, the SEAT factory recently relocated part of its manufacturing plant abroad, leaving a huge empty space in the middle of Zona Franca, jeopardizing the economic vitality of the area. The question now arises of how to take advantage of these vacant industrial plots in an uncertain economic future?

The strategy of the project is to create a new spatial framework that supports the existing flows of transport, energy and water, thus catalysing the potentials of the industrial area. To achieve this, we investigated the theories of industrial ecology and cradle-to-cradle. These seek to make the cycles of material and energy more efficient.

The new proposed framework consists of two elements. The first element is the creation of an infrastructural grid. This grid starts from the logic of the existing flows and will evolve in time, guiding possible developments. The second element is a toolbox of spatial catalysts that present possible solutions to improve the area and highlight its qualities. The combination of both creates a new framework that will work with the existing potentialities and create added value to the site to attract new industrial and economic activities.

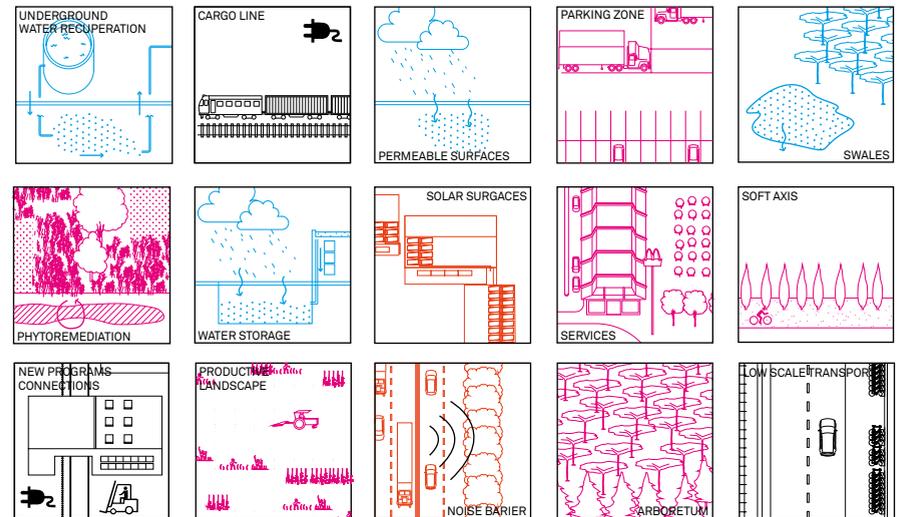
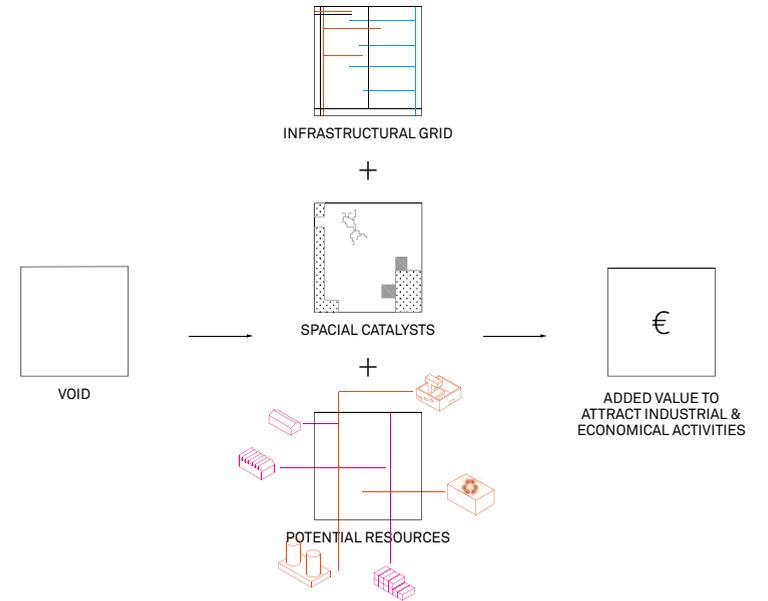
The project is more of a method than an overall masterplan, and we hope it will be a guide for other projects in other locations. It proposes a process that is open to different future opportunities; it is more pragmatic and flexible than a project based on a masterplan, since it accepts and prepares for economic and spatial forms of evolution in the future and during the phase of change that the Zona Franca faces. The result is scenarios that can evolve in time and space. The Zona Franca will be a living laboratory for sustainable industries and new economic territories, and it will close material and energy cycles.

— **Andrès Bellera, Enrico Bivi, Julia Gallardo, Antoine Horenbeek, Engy Khaled, Filippo Marchiori, Fernando Montoya Martinez, Laura Rijsbosch**



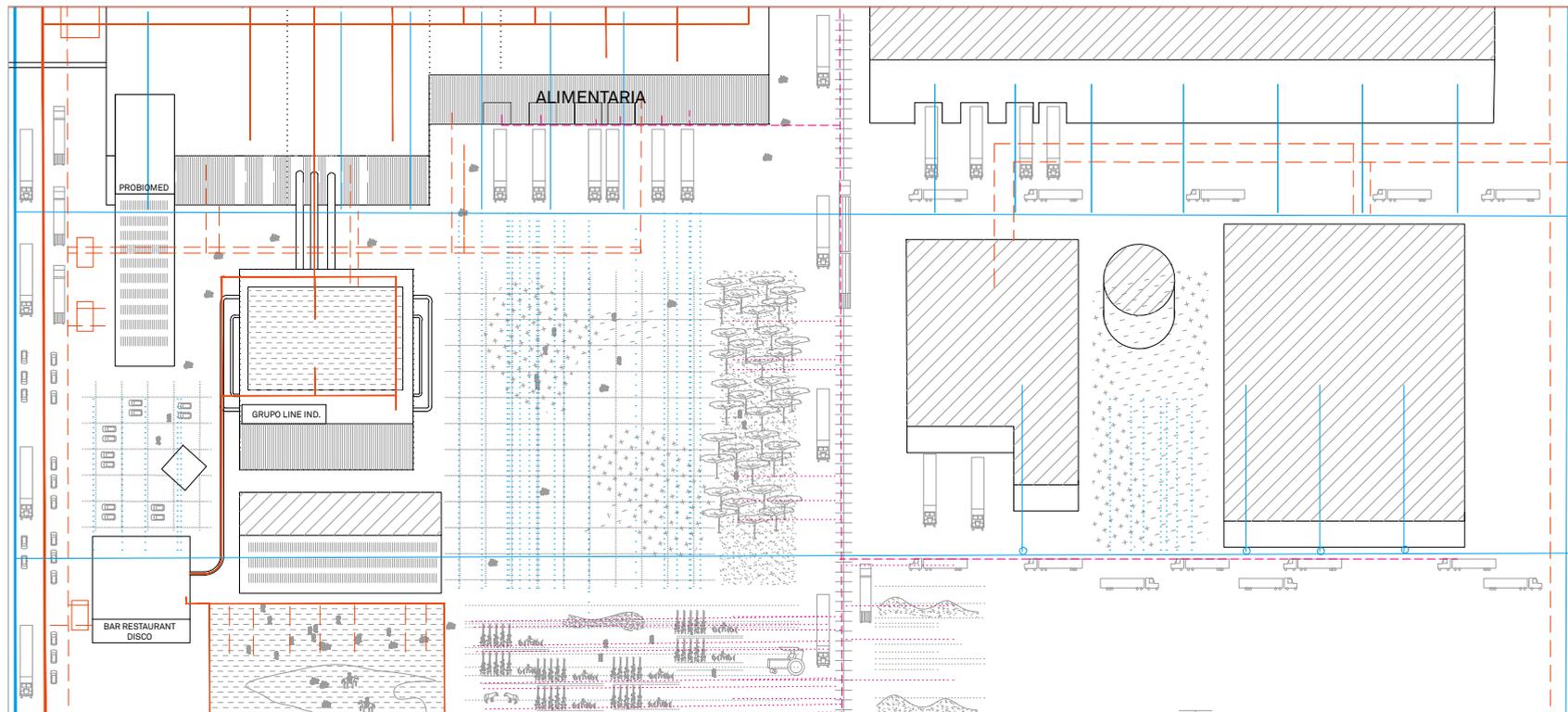
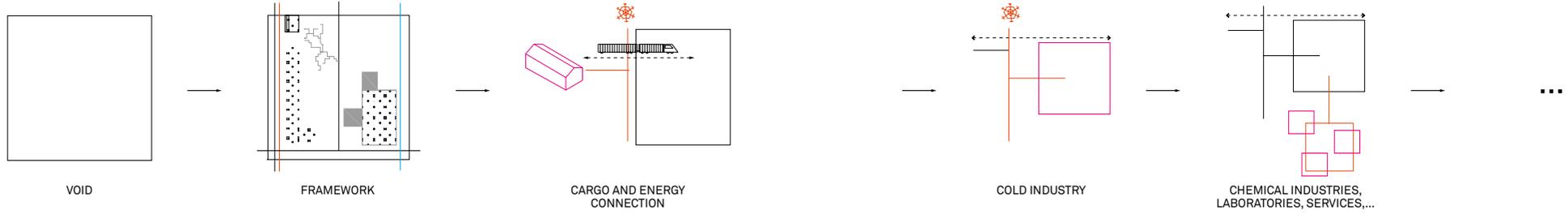
Surrounding flows

The empty site of BZ is surrounded by potential flows. The gas cooling tanks in the harbour provide cold to the trigeneration plant passing the site. The site has a big rainwater collection capacity; it has the metro line next to it and different industries are nearby.



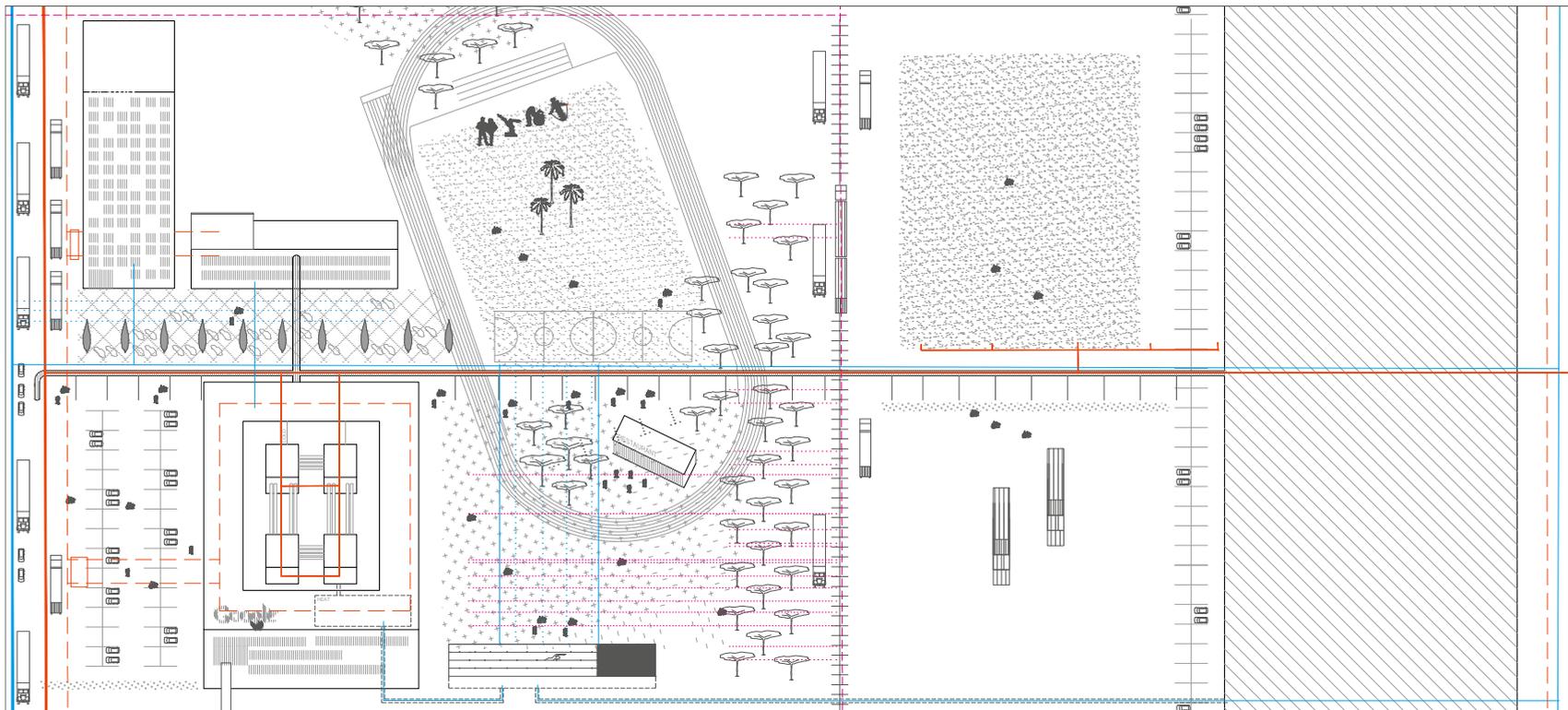
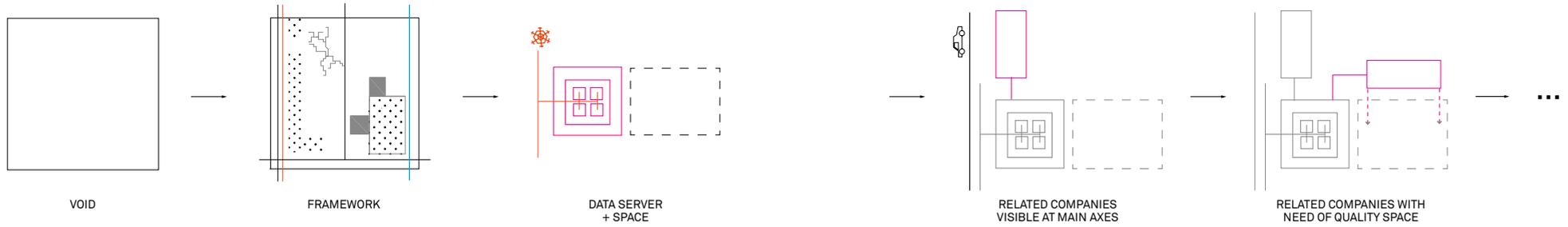
Strategy & Toolbox

Empty spaces are upgraded through the infrastructural grid that is derived from the existing flows, spatial catalysts and existing potentialities in the area. A set of spatial, infrastructural and architectural catalysts trigger new economic and leisure activities.



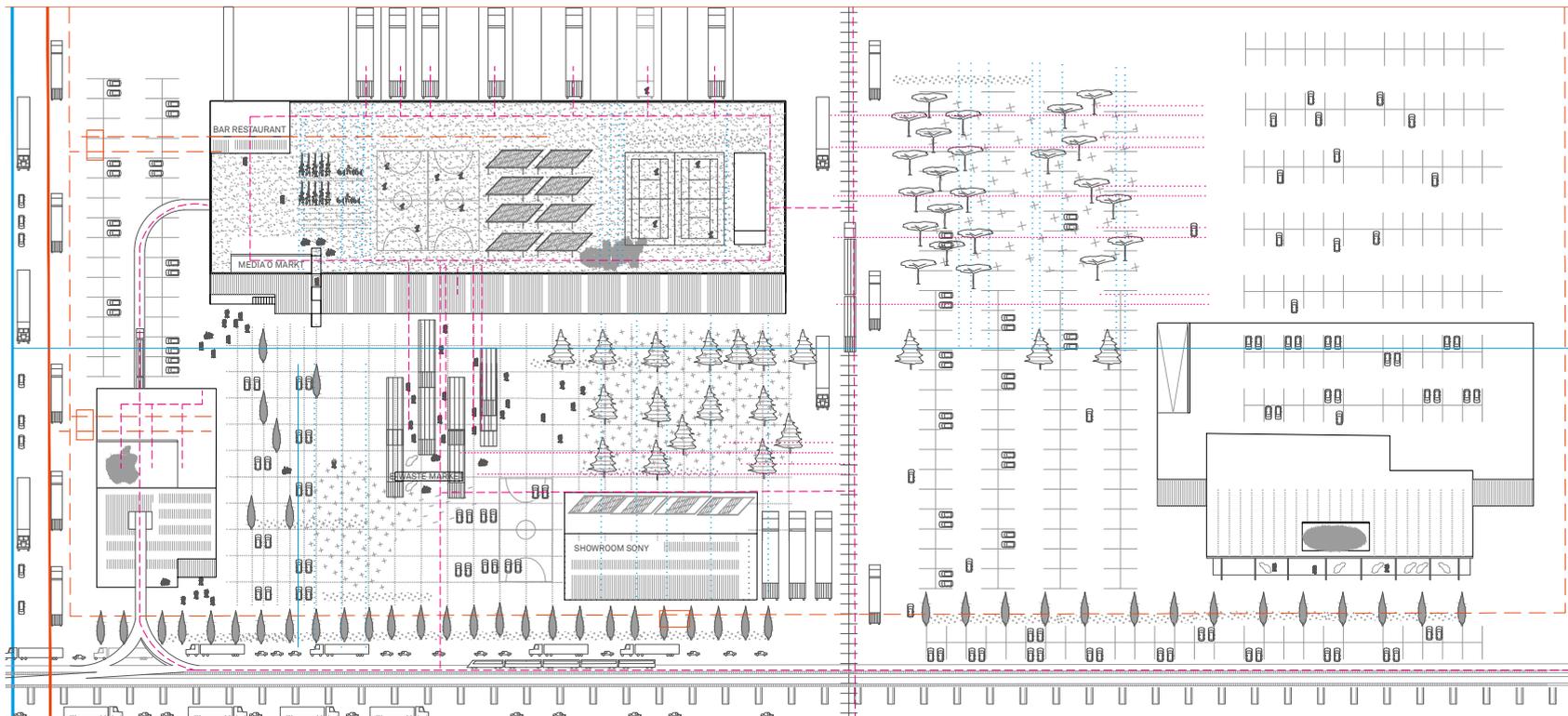
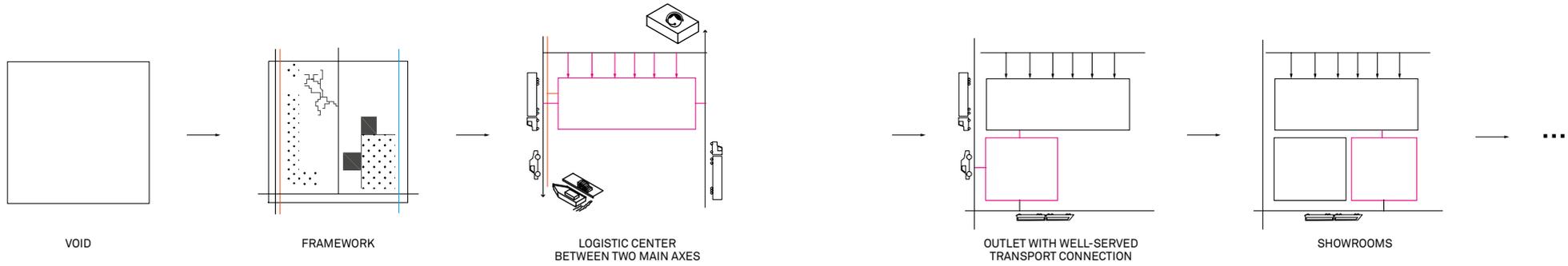
Food industry scenario

In this scenario, we take advantage of the location of the site next to Mercabarna market. Organic resources provided by the market and the cold flow will trigger new industrial development.



Data centre scenario

In this scenario, the introduction of a data centre becomes the catalyst for attracting computing research centres, e-shopping warehouses and industries.



Logistic centre scenario

In this last scenario, a logistic centre triggers the development of commercial activities, taking advantage of available cheap space and proximity to wholesale businesses.

GROUP 2:
**BEYOND THE SPINE:
 CLOSING THE CYCLES**

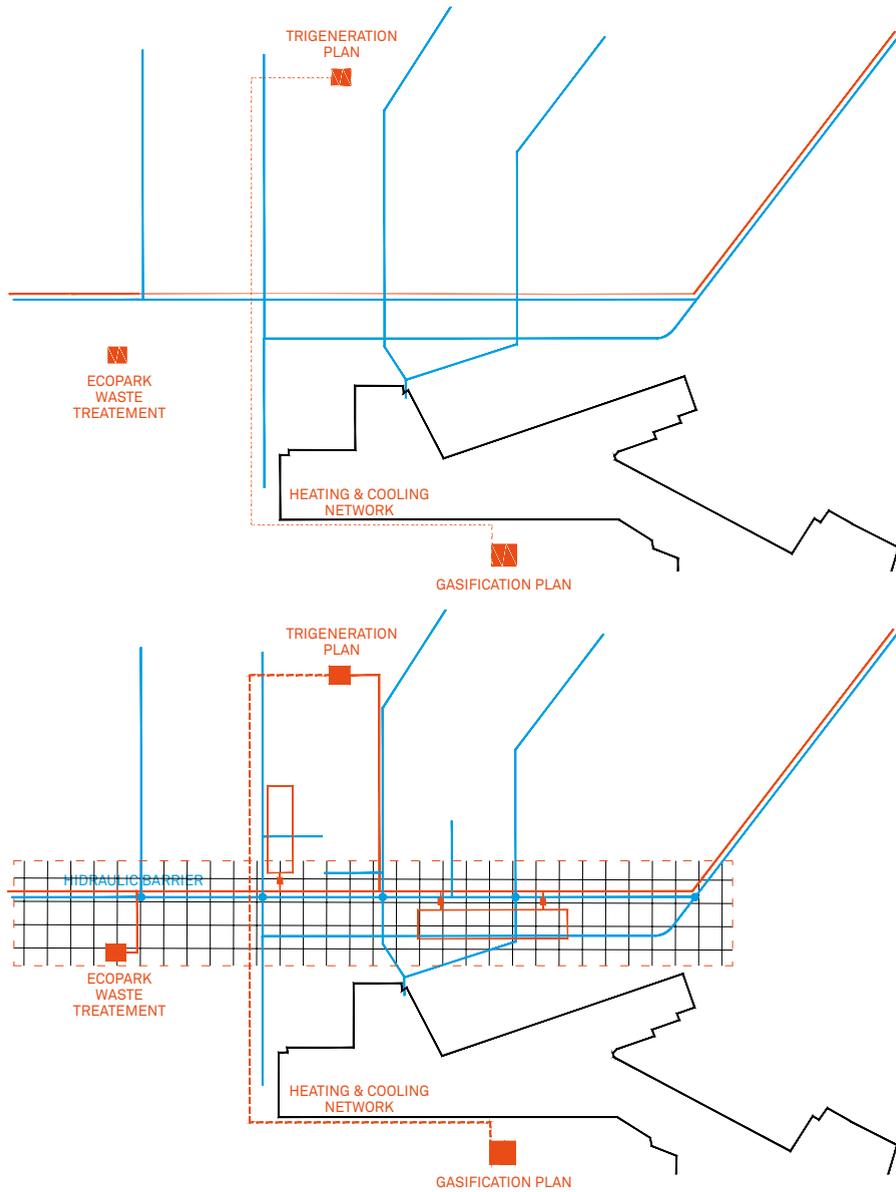
To urbanize the vacant Barcelona Innovation Zone, 50 hectares of large plots abandoned by SEAT, we needed to look at the larger metropolitan network of flows. By adopting a global approach, the group soon recognized the potential that the Carrer A infrastructure offers and designated it the spatial catalyst of the site so that its development would take place in a sustainable way and create urban continuity. This strategy will attract new flows and reinforce the underused existing networks.

We envisage linking Carrer A with the city centre, using the infrastructure for the future metro line 9 to insert a tramline running past Montjuïc on its west side along the harbour. On the east side, the tramline would continue to El Prat Airport. Carrer A forms the backbone of both the Zona Franca and the harbour. The next step would be to link the BZ area with the closest residential neighbourhood, Marina del Port, via the Passeig de la Zona Franca in the north. This linkage would be for pedestrians, bikes and private cars. By concentrating the heavy infrastructure along the old riverbed of the Llobregat, heavy traffic could be reduced across the Zona Franca and along Carrer A, where the backbone connects the harbour with the Zona Franca.

The new economies, envisaged as generic boxes plugged into the backbone, fit in with the Consorci Zona Franca's Innovation project for the site. The Consorci wants to attract companies along the following three axes: a food axis, a technological and a cultural axis. We looked for companies already present in the Zona Franca and the harbour, which would be able to extend their activities to attract members of the public in the first place and, as soon as possible, new investors to the area. Public investments in the networks should sustain this shift, starting along the backbone, expanding in later phases to the whole site.

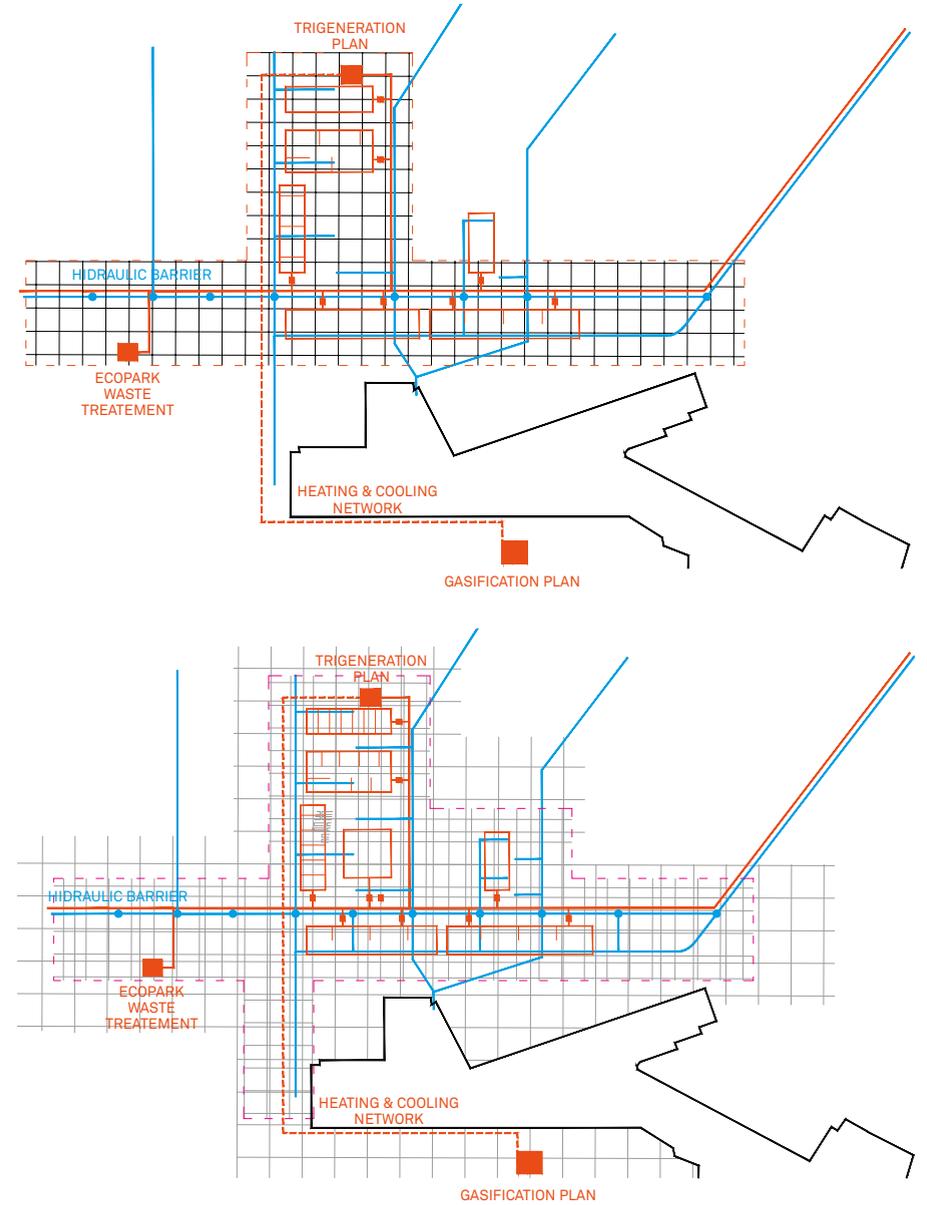
The development of the site is envisaged as a process involving different steps. In the beginning little investment would be needed to incubate new activities, as these will be generated by companies mostly already present on the site. They could – in various scenarios – extend their activities to include leisure and commercial ones, heightening visibility, creating an identity for the site, and opening it up to visitors and more investment. After having generated new boxes, some incubators might disappear, providing an opportunity for others to plug in and take up their place in a more independent way. In this way, a continuous process of upcycling would keep the site dynamic and attractive for investment, guaranteeing its future as the productive backbone of the metropolitan city and region of Barcelona.

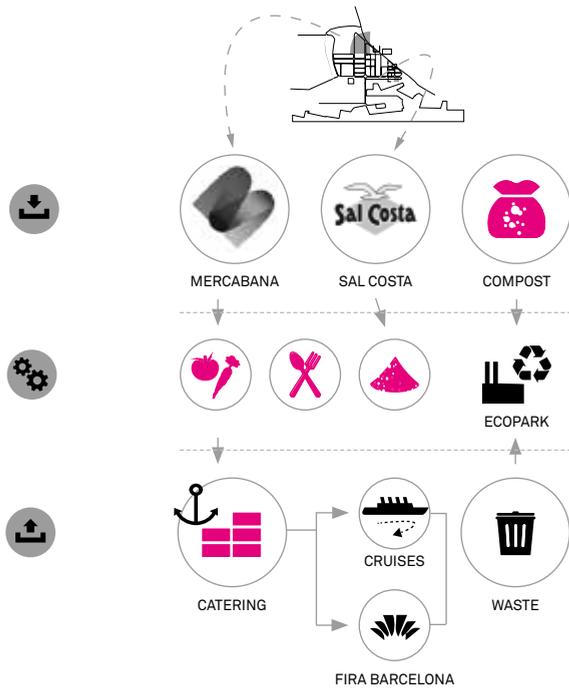
— Sarah Avni, Céline Foubert, Stefano Teker, Luis Bellera Fernandez De La Cruz, Vittorio Salvadori, Matteo Vianello, Alessio Milan, Kristien Van den Houte



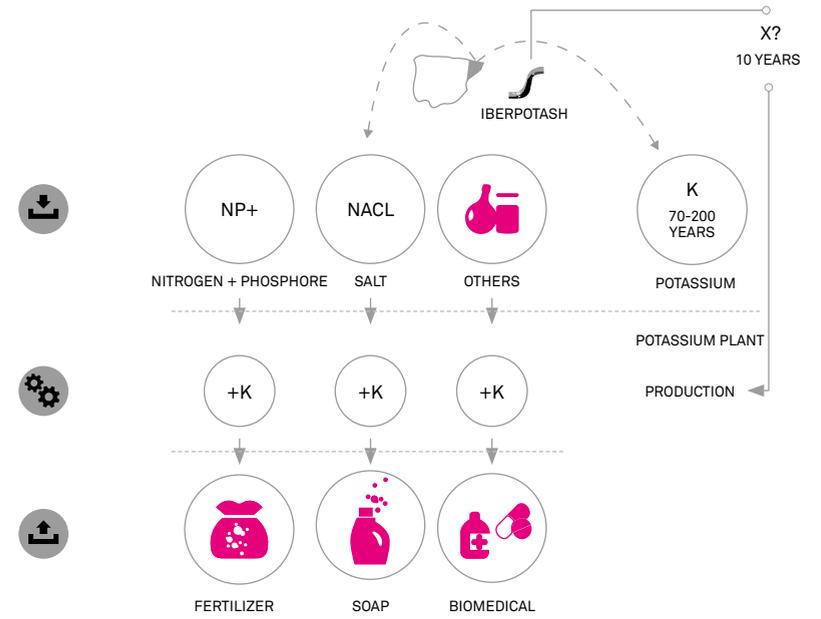
Cogenerating flows

Using the carrier A as a backbone in order to develop the networks and enhance cogeneration of flows in the Zona Franca. The water network includes the circulation of cold water from the gasification where needed and a hydraulic barrier against salinization of the soil. The energy network will be extended to incorporate the underused heating and cooling system from the Trigeneration plant and the electricity produced by the Ecopark.



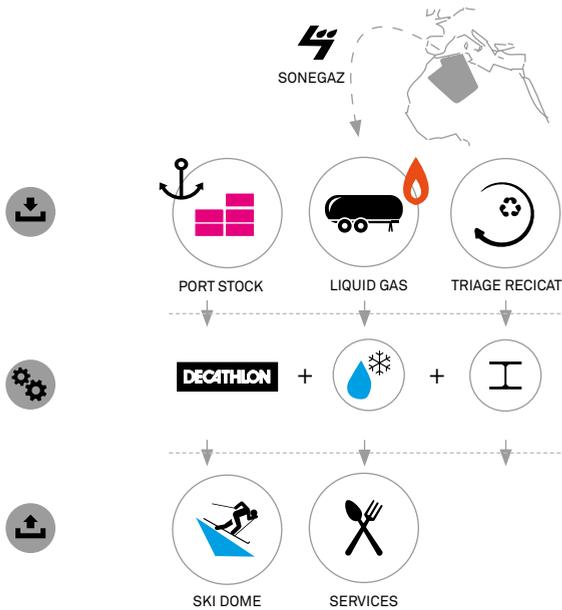


1



2

4



Closing food and energy cycles

Food from Mercabarna and salt from Sal Costa can be stored, shipped and/or used for catering on the BZ site for cruiser and exhibitions. The waste can be incinerated in the Zona Franca Ecopark to form compost. Using cold water from the gasification process and recycling steel from the Triage plant.

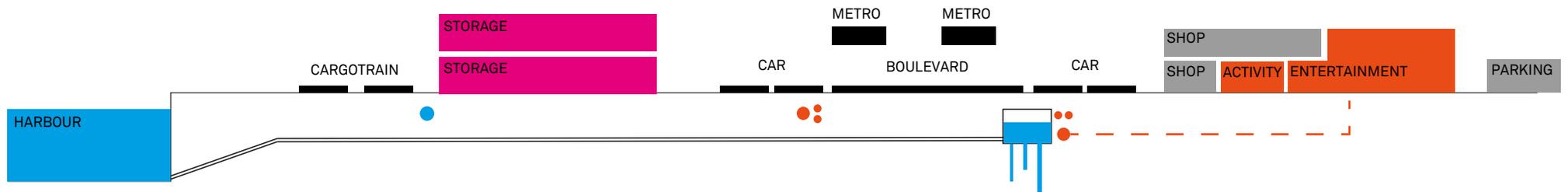
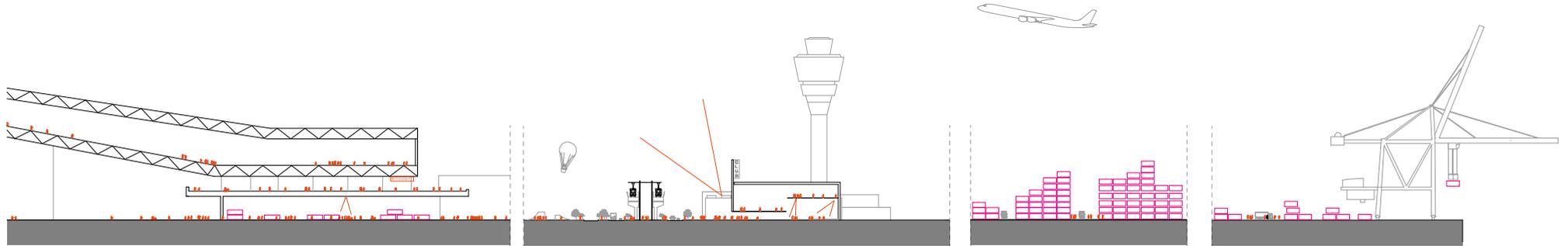
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Closing organic waste and material cycles

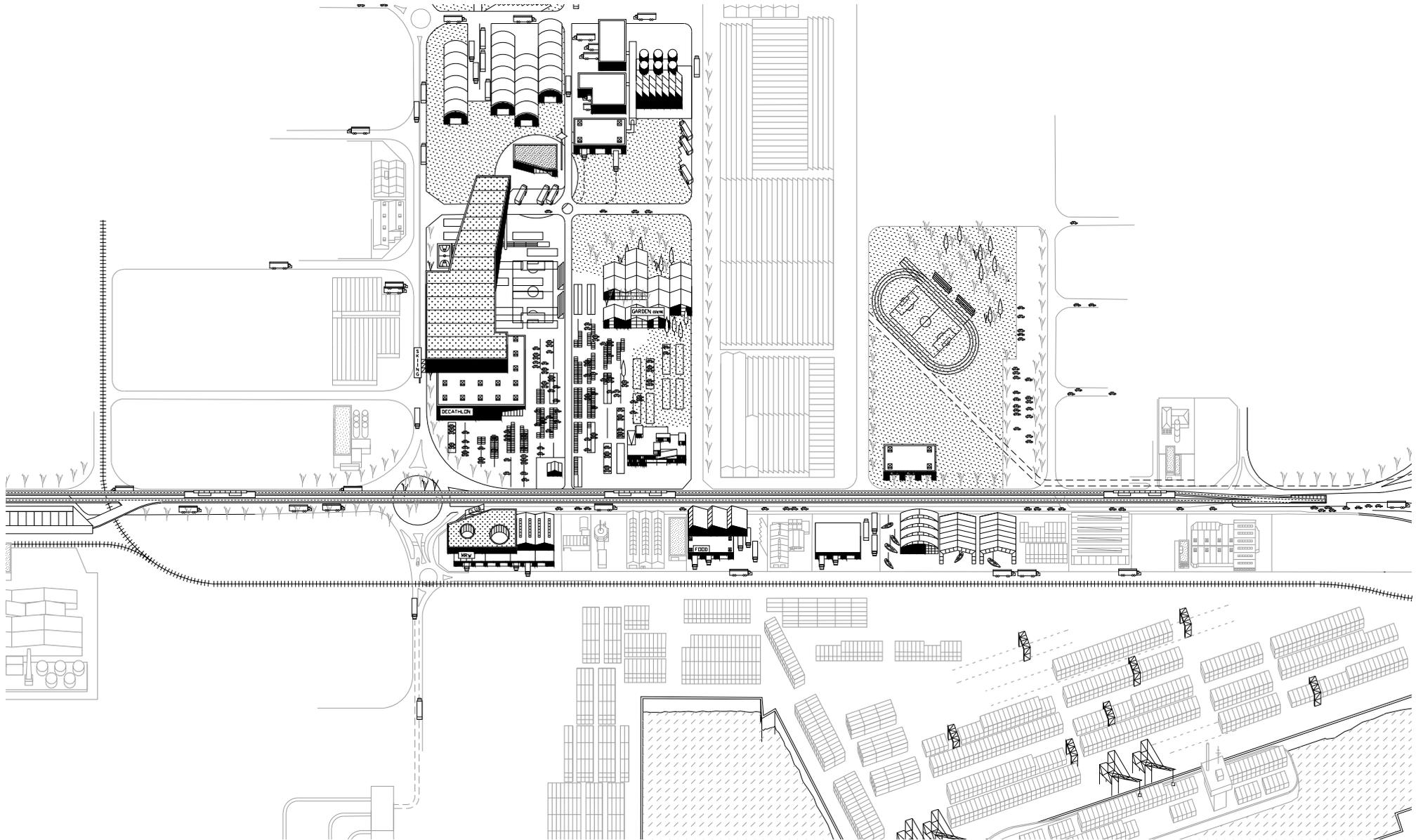
Agricultural fertilizers can be produced using potassium (K) from Catalan mines. If K is mixed with salt, soap is produced. Mixed with other chemical ingredients, biomedical products can be made. Glass recycled at the Triage plant in Zona Franca and recycled containers can be used to construct greenhouses for growing plants and clean ground.

■ PRODUCTS



Development scheme

A development scenario shows how activities and flows can be cogenerated. The mono-functional BZ area is turned into a dynamic place: investors exhibit their products made on the site, workers upgrade their skills thanks to the presence of universities and other knowledge industries.



Dynamic future

New urban industries enable redevelopment of the site. Activities requiring little investment, wound around the backbone, attract people to the site, filling it in a flexible, temporary way. In a second phase, spin offs, smaller industries and local shops, restaurants and bars densify the plots, forming clusters. Later on R&D and training centres complete the programme, giving a new identity to the Zona Franca.

SITE C ENERGY NETWORKS AS URBAN CATALYST

The accessibility provided by the presence of major infrastructures (train, highways) and the self-organization of the Zona Franca has contributed to its own isolation in functional terms vis-à-vis the surrounding urban fabric. The urban transformation in the surrounding areas – which incorporates new types of logistics, the Fira complex and the Plaza Europa office hub to overcome the infrastructural character of Gran Via – has opened up discussion about the closed character and future permeability of the Zona Franca.

On the fringes, the buffer area created by the Ronda Litoral, combined with the high-speed train depots at Can Tunis, might be traversed at two strategic positions: an underground tunnel has already been constructed, the other would be an extension of the ADIF Bridge.

Expanding urban transit/transport systems and combining this with extending energy networks so that the energy surpluses at present concentrated in the Zona Franca and the harbour can be spread to surrounding areas could create new models for upcycling and revitalizing the urban fabric. The recent construction of the tri-generation plant is an example of how on-site added value can be created and contribute to such a model.

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FLOW-BASED DESIGN STRATEGIES

Sybrand Tjalingii, Cataline Dobre & Nadia Casabella

In our cities, flows are mostly channelled in or along conduits, and when they are not, they become a risk that needs combatting. These conduits, whether roads or pipelines, can either be seen as an obstacle to the passing of other flows or they can be seen as an opportunity to be plugged into. In our case, there is a large transport infrastructure corridor running along the east-west axis, comprising the ring road or Ronda Litoral, and the railway yard of Can Tunis. The main utility networks, for cooling and energy, run perpendicular to the axis and follow the main streets (Avenida Juan Carlos I). We had to quickly choose our battles: should we go with the flows, plugging into them as they are? Or should we confront the existing flows with sustainable urban metabolism scenarios and spatial structures that can act as carriers?

HIDDEN OR VISIBLE

Within the concept of urban metabolism, the city is perceived as a sociotechnical network composed by 'hidden' and 'visible' elements. If technical networks and the 'hidden city' have traditionally been the field of engineers, architects and urban planners have been more concerned with the 'visible city' (Gandy 2004). The workshop explored the opportunities for introducing the technical networks into the 'visible city'. How can energy, materials, waste and water flows contribute to enhancing the urban environment? And what does it mean

for this industrial area that belies any traditional notion of what we consider city or *cityness*.

The initial focus of the students was the transport corridor, the most visible element indeed, which was seen as an obstacle, as something to be straddled in order to connect the two sides of the corridor. First enquiry followed: what was already there and what would be achieved by establishing a new connection? In the eastern part harbour activities, waste treatment, manufacturing industries and agro-food logistics dominate. This is the world of big flows and big spatial units – although it is becoming increasingly attractive to smaller tertiary activities that see the ring road as a premium location. The western side is a world of smaller flows, of smaller spatial units, and of smaller private companies – but also of bigger developments, such as the new Fira international exhibition halls and the Plaza Europa. This area is also at a turning point, increasingly accommodating new residential developments within its boundaries.

FLOWS

The analysis of the first week revealed the networks and characteristics of hidden and visible flows. Strategies emerged. Regarding *energy*, this would imply cutting down on fossil fuels by simultaneously reducing losses and relying on local resources. In concrete

terms, the whole area could benefit from a further expansion of the cold and heat networks powered by the tri-generation plant. In a more sustainable long-term perspective, it would make sense to replace the liquid natural gas (LNG) with a renewable fuel such as biogas from organic waste, sewage or energy crops. The biogas could initially be brought in from the Ecoparc Barcelona or the sewage treatment plant, both of which are situated to the west of the harbour basin. Later it could be produced by the tri-generation plant itself, which at present already generates heat by burning dry organic waste. The tri-generation plant could develop into an experimental station for testing promising new co-generative technologies to produce gas, fuel, electricity, cold and heat for the urban networks. At the building level, photovoltaic cells could be placed on the many sizeable roofs of the warehouses located in the area, while at the urban level roadsides could be used for this role.

Regarding *water*, a more sustainable strategy is highly relevant in the Barcelona context. Fresh water is already scarce, leading to excessive groundwater pumping. In coastal aquifers fresh water floats on top of denser seawater. When withdrawals reduce the freshwater lens, seawater rises up from below and enters aquifers and wells. Other problems result from mixing rainwater and wastewater in a single combined sewer system: wastewater overflows are created that pollute the sea. Expensive and big end-of-pipe projects are trying to reduce these environmental impacts: a hydraulic barrier against further salinization has been sited in the Zona Franca and numerous big underground overflow basins are being built in many parts of the city. The strategy aims at using rainwater and treated wastewater for cleaning and other purposes that do not require drinking water quality. Rainwater can be

collected on roofs and used inside buildings, or be collected and de-polluted in urban green spaces and along the Ronda Litoral and other roads. A key issue in the strategy is disconnecting wastewater and rainwater flows in a stepwise fashion. In the end this will solve the combined sewer overflow problem and will reduce the size of new sewers and the required capacity of sewage treatment plants. Pure wastewater, not mixed with rainwater, can produce more biogas and will make the treatment plant de-pollute more efficiently.

THE PROPOSALS

Incorporating the flow strategies, the two teams focused on the confrontation of the transport corridor and its connections between the eastern and western sides. One team (*the backbone*) opposes the dominant transit-nature flows, and proposes a strategy based on dismantling the corridor. Leaning on some key plans for the deviation of the railway corridor to the old Llobregat riverbed and for the substantial reduction of traffic on the ring road crossing Barcelona's seashore side, their strategy consists in breaking up this barrier in order to bring about a qualitative change to the flows crossing the area. Their design proposal entails a series of small, catalyst programmes along Avenida Juan Carlos I, extending into Carrer E, which bisects the SEAT site: new nursery facilities, shadow and wet devices to render the sidewalks less hostile... A new business incubator would first be built as an inhabited bridge. Later, it would grow further on the brownfield sites after dismantling and substantially slimming down the transport infrastructure.

The other team (*multi-modal hub*) opts for a plugged-in intervention, attempting to extract maximum gain from the existent flows, sometimes transforming them and sometimes simply acting as a hub

for exchange. Placing a switching platform above the transport corridor would capture some of the passing flows and divert them into the surrounding area: P+R facilities for commuters leaving their cars and taking the metro, nomad-offices for the Fira users, e-shopping centres, urban distribution centres for small parcels.

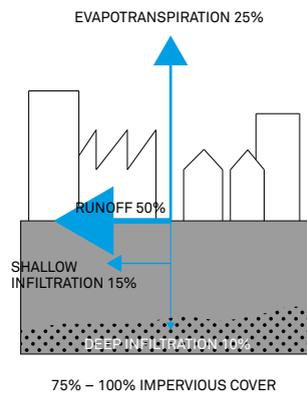
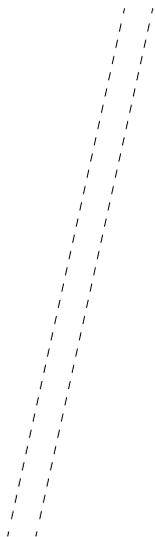
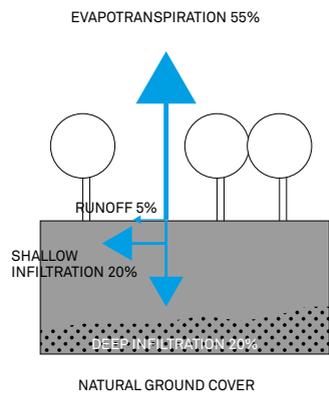
UNCERTAINTY, ECOLOGY AND URBANISM

In these uncertain times, shaken by an economic crisis and vulnerable to climate change, it seems pointless to make urban plans – particularly in this area, which is so heavily subject to unpredictable fluctuations in economic activity and global economic conjunctures. Yet there are things we can be sure about: it will rain, we will use water and energy, we will produce waste and we will need transport. These all require robust networks

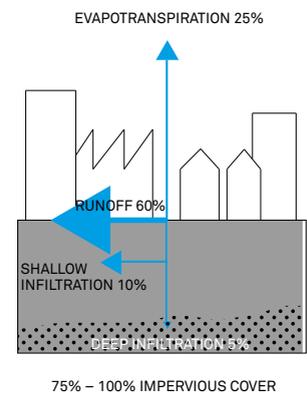
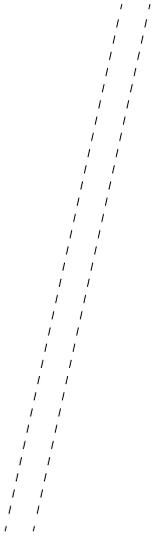
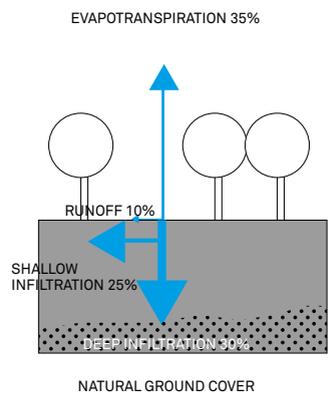
and a flexible infill steered by sustainable programming. By turning pilot projects into demonstration projects and by drawing attention to built elements that can play a catalyst role, designers could make this innovative process visible.

At site A there is the old riverbed. At site D there is the foot of Montjuïc. But at site C there is hardly any trace of the past natural or cultural landscape history that would be capable of playing a meaningful role in the urban layout. 'Working with nature' here primarily implies working with processes, thus working with flows. Modifying the existing physical grids (e.g. road system) and technical networks (e.g. electricity or water) and adjusting their size and orientation to create an alternative flow management would seem to be the most adequate strategy for reconciling urban metabolism and design: a flow-based design for urban development.

WATER FLOW SECTIONS – SUMMER

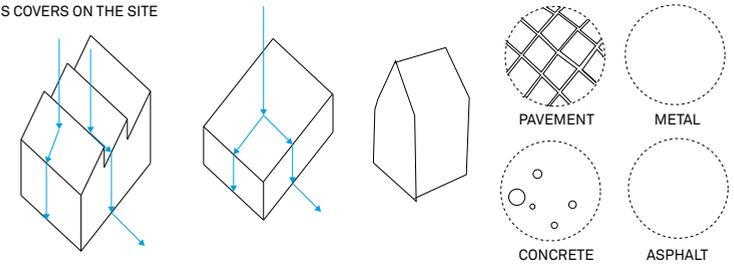


WATER FLOW SECTIONS – WINTER

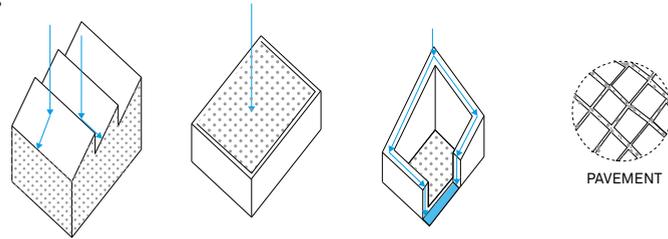


RETARDING THE WATERFLOW

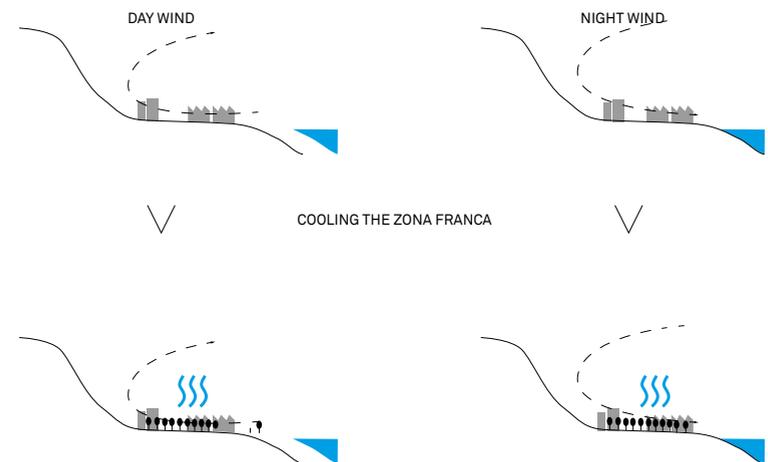
IMPERVIOUS COVERS ON THE SITE



SOLUTIONS



NATURAL AIR FLOW CYCLES



GROUP 1:

ZONA FRANCA BACKBONE – A SPATIAL CATALYST FOR CON- NECTING A FRAGMENTED AREA

How can the Zona Franca be revitalized? This area of the city, once the production hub of SEAT (among others) and the logistic epicentre of Spanish commerce, has been gradually declining in importance. Quitting enterprises and a marginalized position between port and infrastructure have turned the Zona Franca into a withering appendix, disconnected from surrounding urban renewal and struggling for a new lease of life.

Our project aims to integrate the Zona Franca into local and metropolitan flows, based on a scenario in which long distance throughput is drastically reduced, and a new form of locality is reinforced. This would happen through a multi-level approach, suggesting strategies to overcome local barriers and establish a new backbone which relinks several fragmented places into a new urbanity.

In recent years, several proposals for the urban renewal of the Zona Franca have been drawn up, some local and some global. A good example is *Barcelona Innovative City*, which proposes converting the SEAT terrain into an R&D campus. Our project builds upon or questions some of these suggestions in order to offer a glimpse into a possible future of the site.

The new backbone would be traced from the Mercabarna district in the west (which would develop new functions), through the new R&D campus on the SEAT grounds. It would then cross what is now the terrain occupied by the highway and rail infrastructure, to continue towards the Fira convention centre and the Plaza Europa district, thus creating a multi-functional axis, attracting and maintaining activity in and around the Zona Franca.

Several issues, such as the current traffic situation and the extensive rail network surrounding the site, currently contribute to the isolation of the Zona Franca from its surroundings and heavily constrain its further transformation.

A previous study of the traffic in and around the Zona Franca suggested that heavy truck traffic should be diverted into the Zona Franca and the port all along the Ronda Litoral, reinforcing already heavy traffic loads all the way to Montjuïc. Our suggestion would be to divert this heavy traffic solely through the western access of the Zona Franca, thereby reducing truck traffic towards the east and allowing the development of a softer, small-scale transport infrastructure. This would create an atmosphere more conducive to local connectivity by downscaling the street and privileging pedestrian and light mobility.

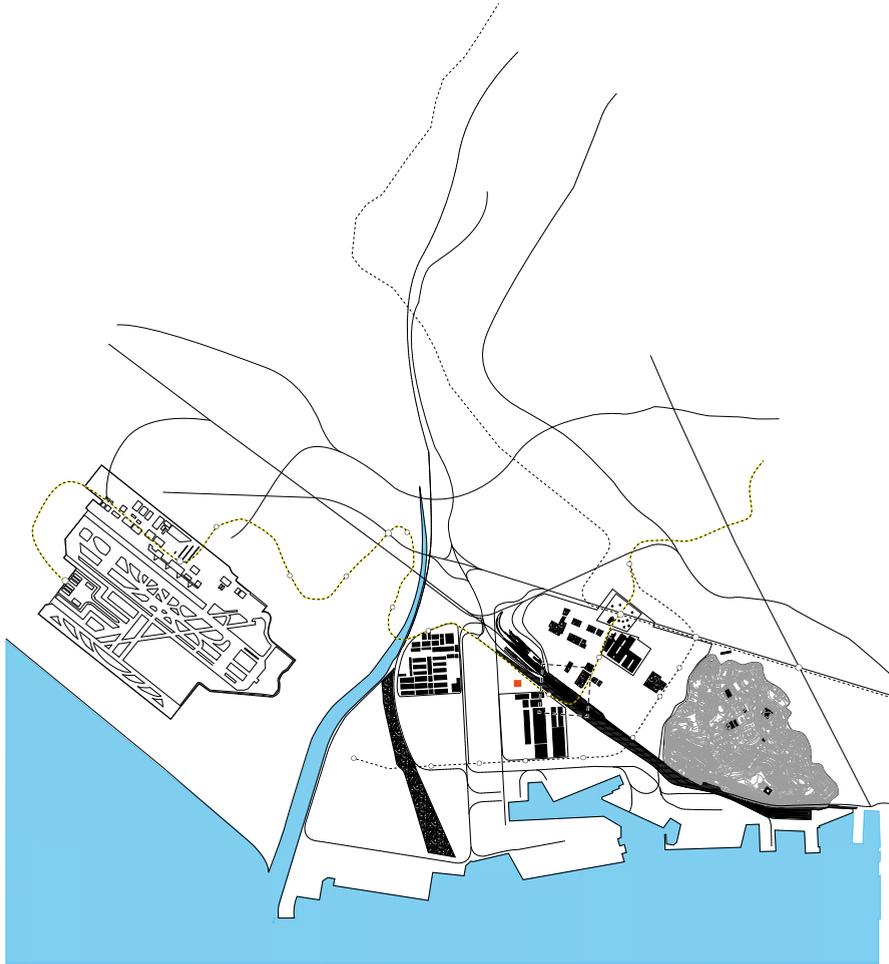
Moreover, the current train infrastructure does not permit or invite any connection between the Zona Franca and adjacent neighbourhoods. Current railway technology forces trains to pass by a switching yard just to the north of the SEAT site, in order to transition between electric and diesel locomotives before entering the port. The scale of this yard has forced passage through a constraining and uncomfortable tunnel.

However, if the port railways were to be retrofitted with inductive electrical technology, trains could continue directly into the port, rendering the switching yard obsolete. Together with the planned displacement of a large majority of the rail infrastructure into the old riverbed of the Llobregat, the elimination of the switching yard would liberate a large pivotal space, one with great potential for becoming a new articulation between two extremities of the backbone, allowing visual and spatial continuity along this axis.

The new articulation would be reaffirmed by a new landmark, an inhabited crossing, housing both public space and an entrepreneurial incubator. This would join a series of new functions, implanted along and around the axis, thus rendering the area more productive and inviting, promoting synergetic exchanges between local actors. The urban fabric would be downscaled in order to allow a greater flexibility of land usage and greater heterogeneity of activities. A mix of professional, knowledge-based ventures and public spots such as nightlife and culture venues would invigorate the surroundings, inviting complementary services and creating round-the-clock activity.

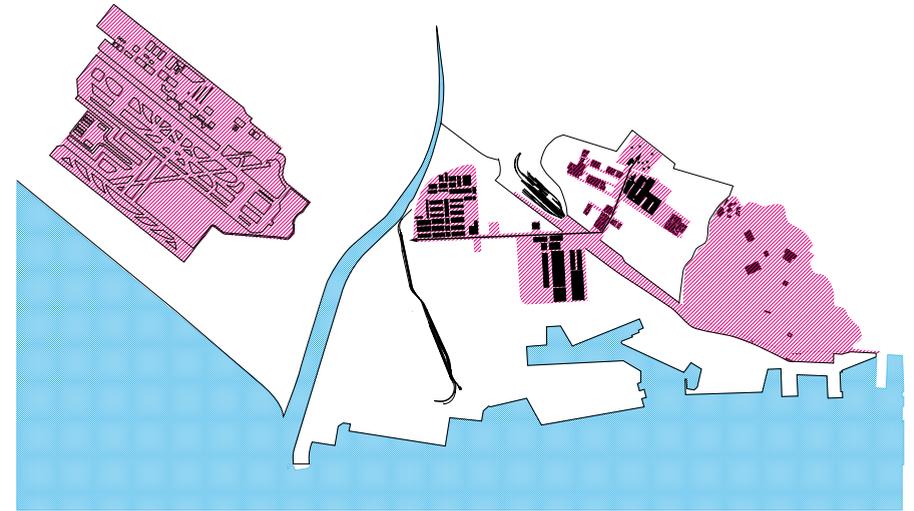
As the Zona Franca is transformed from a neglected fragment into a destination, the backbone will prove to be a veritable catalyst of urban renovation, offering the Zona Franca a chance to discover its real potential as an integral part of Barcelona.

— Adrien Laügt, Nitay Lehrer, Eftalia Proïos, Ivan Van der Seypen,
Theo Vantomme, Manon Wettstein



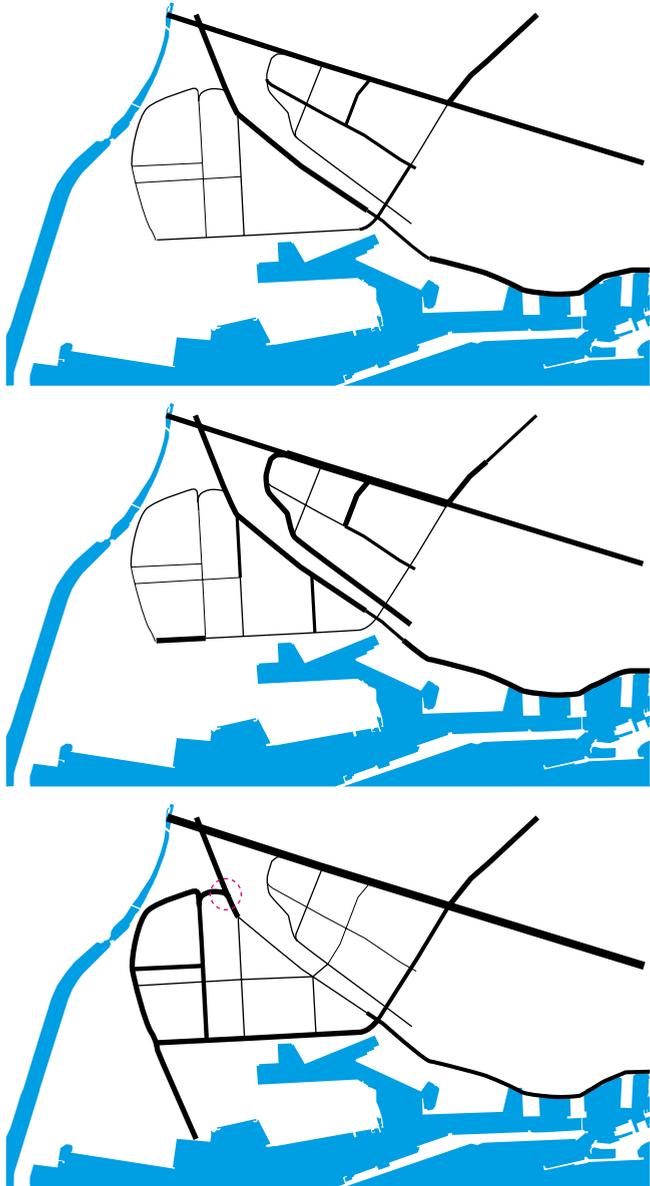
Segregation

Numerous large-scale programmes exist or are planned in and around the Zona Franca: the airport, the Mercabarna food market, large warehouses, the tri-generation plant, the Fira centre and the Plaça Europa district. Zona Franca is crisscrossed and segregated by heavy infrastructure.



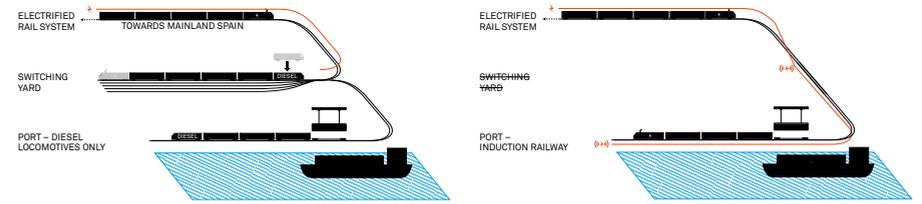
Backbone

The project aims to create a linear infrastructure that reconnects Mercabarna with the BZ site and Fira exhibition centre. The strong connectivity provided by this backbone structure will act as a catalyst for programmatic and spatial revitalization.



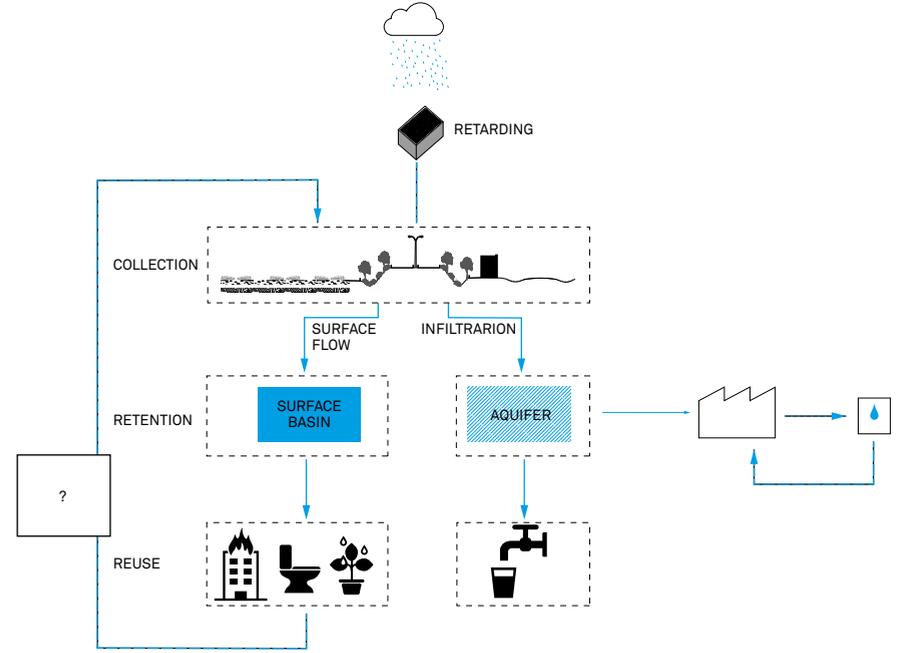
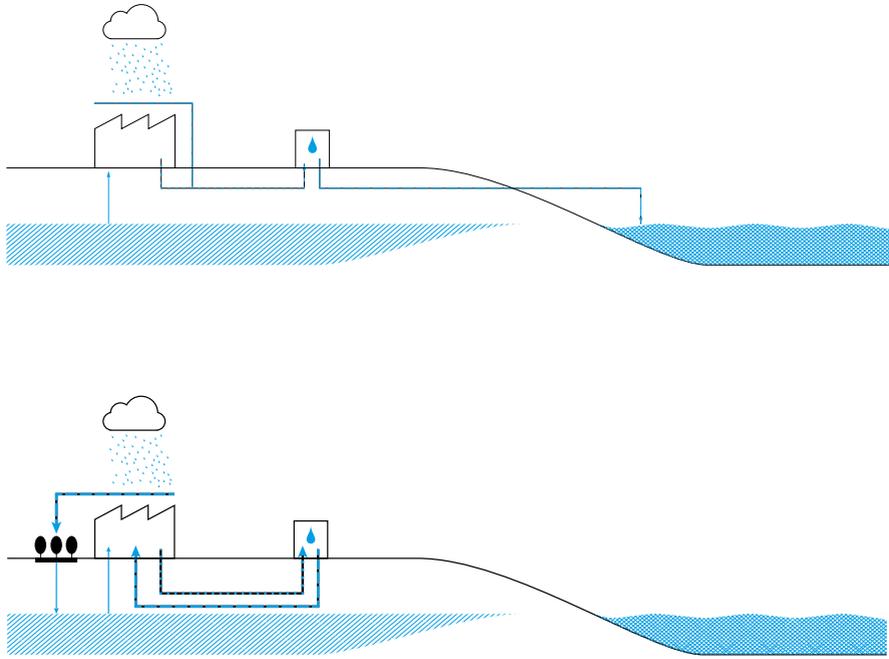
Alternative road network

The current road system project perpetuates the congestion problems caused by the presence of heavy traffic. Our alternative suggests restricting heavy traffic access to the west and around the Zona Franca, allowing the downscaling of transport infrastructure and promoting softer modes of mobility.



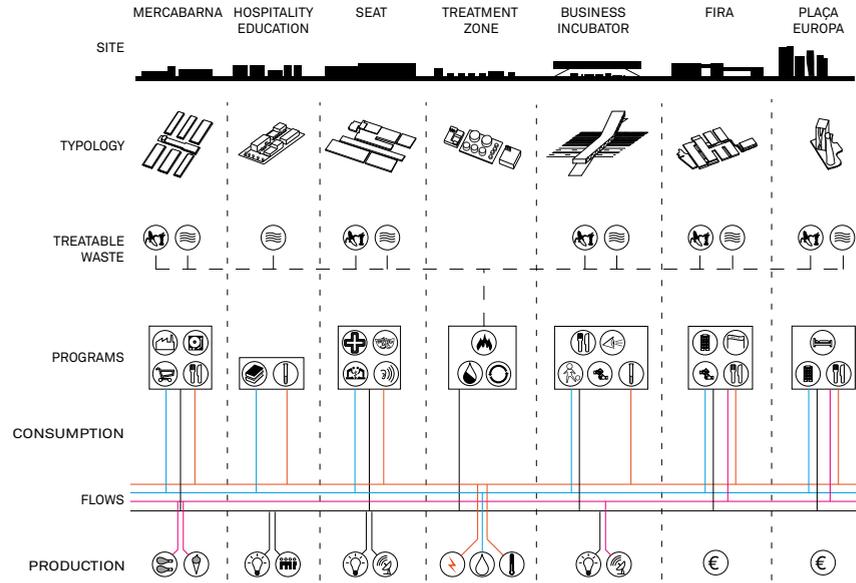
Alternative railway network

Having to shift from electric propulsion to diesel before entering the harbour forces trains to go through an immense switching yard. The introduction of inductive electrical technologies, combined with the planned displacement of rail lines free up the yard space parallel to the Ronda Litoral.



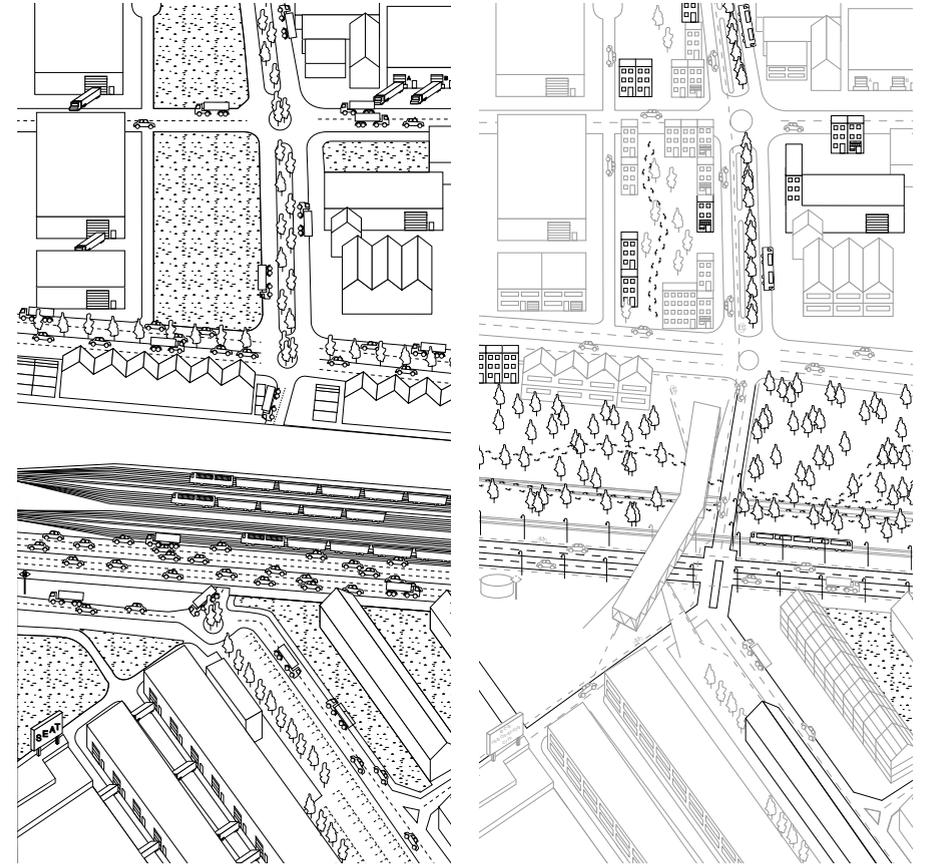
Water recycling

The new backbone and the landscaping of the Ronda highway enable rainwater to be recycled and cleaned so both can be used to feed the aquifer and for domestic use.



Interaction along the backbone

The projected connection aims to reinforce the exchange of flows between the different programs. The existing heat, cold and electricity networks are broadened to serve new areas and programmes, taking advantage of new local synergies.



Backbone evolution

Bridging the switching yard with a new landmark, facilitates passage and instigating a new urban axis. In a second phase, a park replaces the switching yard, forming a green corridor up to Montjuïc. The Ronda Littoral is downgraded into an urban boulevard, making the passage along the backbone even more pleasant and inviting.

GROUP 2: THE HUB

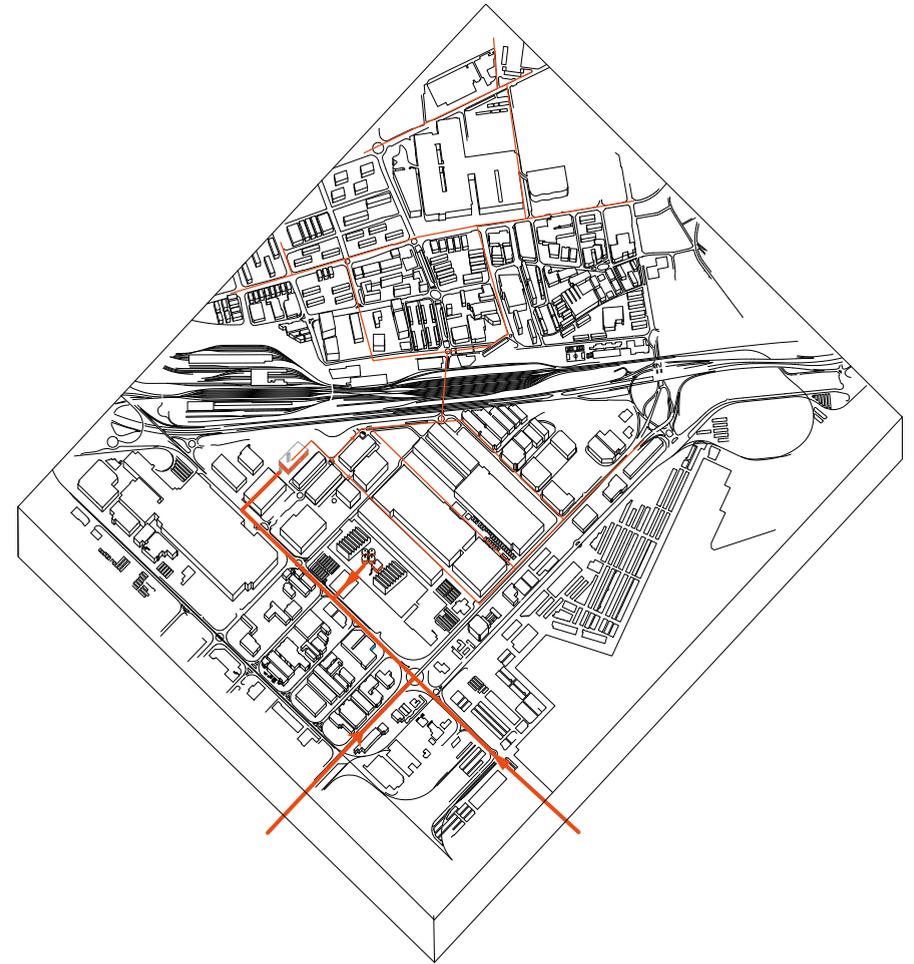
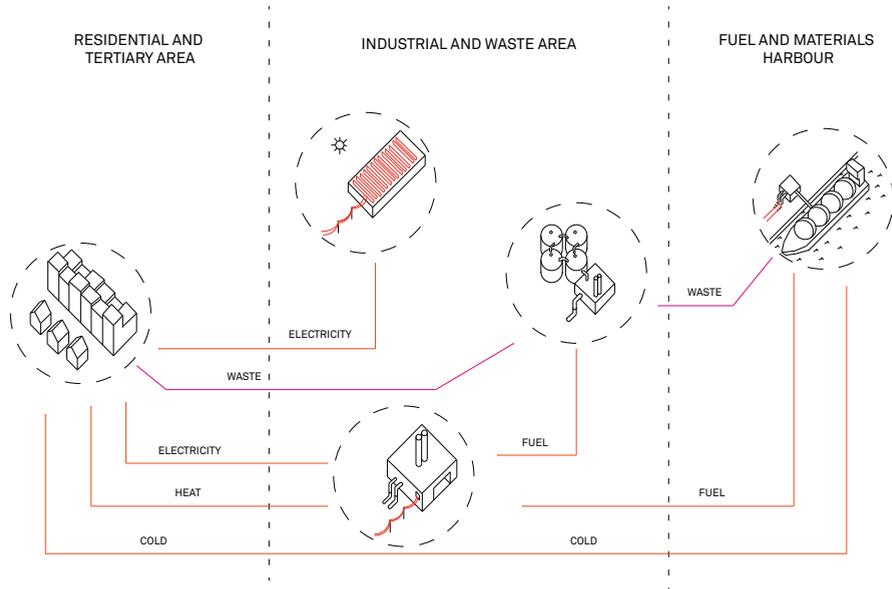
The metropolitan area of Barcelona is under constant transformation, despite the European economic crisis having slowed down its development. Zona Franca is one of the most important areas where these transformations are happening. The area is crucial for Barcelona due to its connection with the metropolitan area and the major economic activities happening there: proximity to the harbour, to the Fira exhibition centre, to the Ronda Litoral highway, to Mercabarna and to the airport.

We imagine that in twenty years time Zona Franca will become a key area in the further development of the harbour and of the area surrounding it. Our design proposal focuses on the existing barrier that the Ronda Litoral highway represents, splitting the area in two zones. On one hand, the northwestern zone will see its residential and tertiary sector consolidated and will likely accommodate some of the urban development generated in the rest of the metropolitan area. On the other hand, the southeastern zone will enhance its role as a productive pole of the city and as a logistic centre it will also accommodate a waste-recycling hub under the roof of the former SEAT factory.

At present, the link between the two zones consists of a long tunnel that is difficult for pedestrians or bikers to use, hindering alternative light mobility solutions. First, we propose reducing the heavy flows passing through the tunnel by diverting the heavy trade flows towards the existing railway and road network, i.e. Ronda Litoral and other more peripheral arteries traversing the Zona Franca. Second, we envisage the development of a *hub* to take advantage of the contrast created between the two zones. This hub is located at the intersection of the Ronda Litoral and Carrer Dos and is conceived as a switch point that enhances the 'production-consumption' relation rather than the physical or functional one.

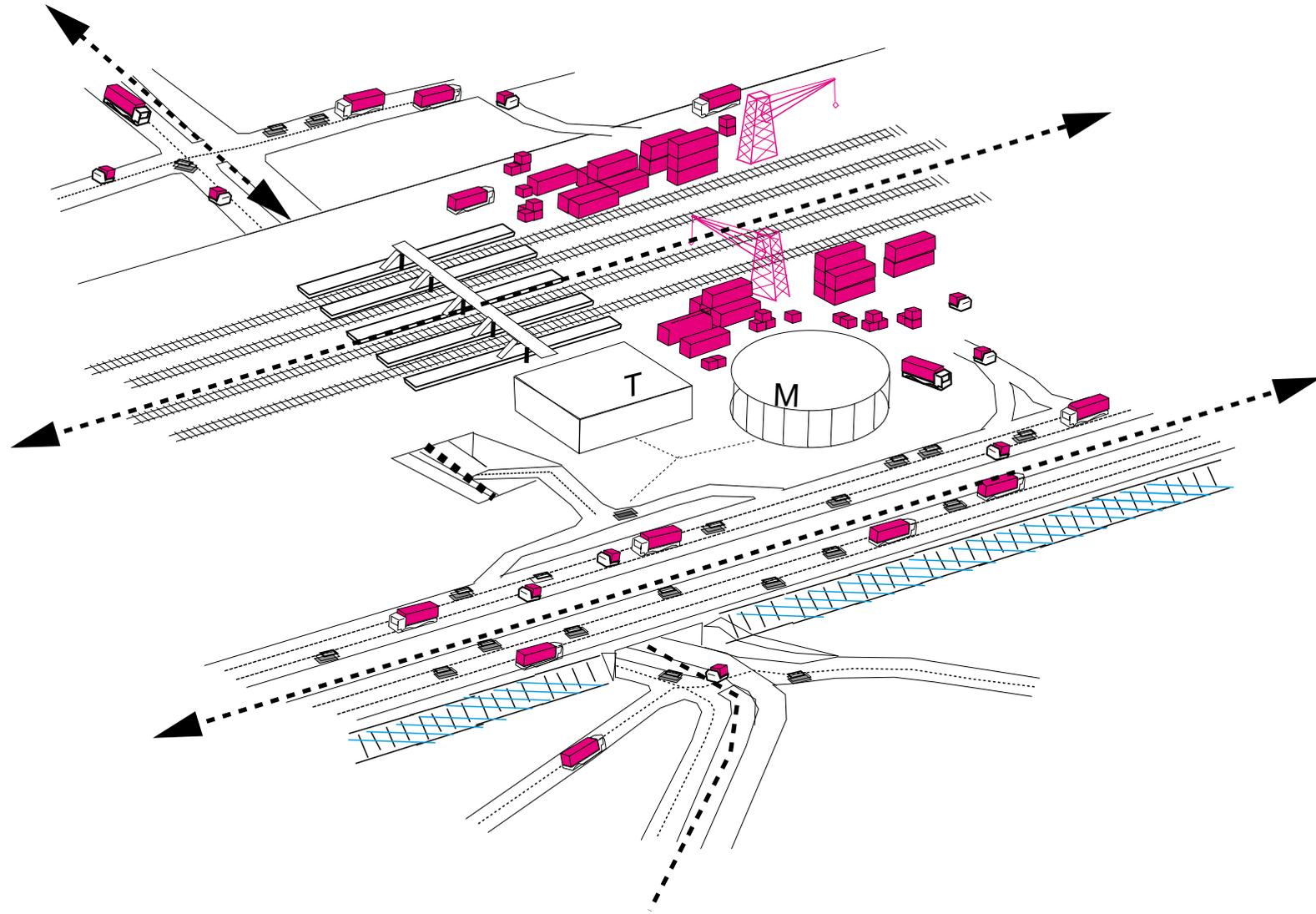
The two zones would be linked together by the flows of energy, water and waste. The energy provided by the tri-generation plant and the depressurization process in the industrial zone could be used for the mixed residential area. The waste from the city and the harbour would be treated in the Zona Franca. Water would be collected on the large roofs in the Zona Franca but also from the roofs of large-scale activities in the mixed area and distributed according to demand. A network of soft mobility would connect the hub with the two zones.

The hub has been designed to contain activities and functions that will add dynamism to the Zona Franca. We decided to make an area adapted for high technology and research in the upper level of the hub that is directly linked with the recycling and production activities.

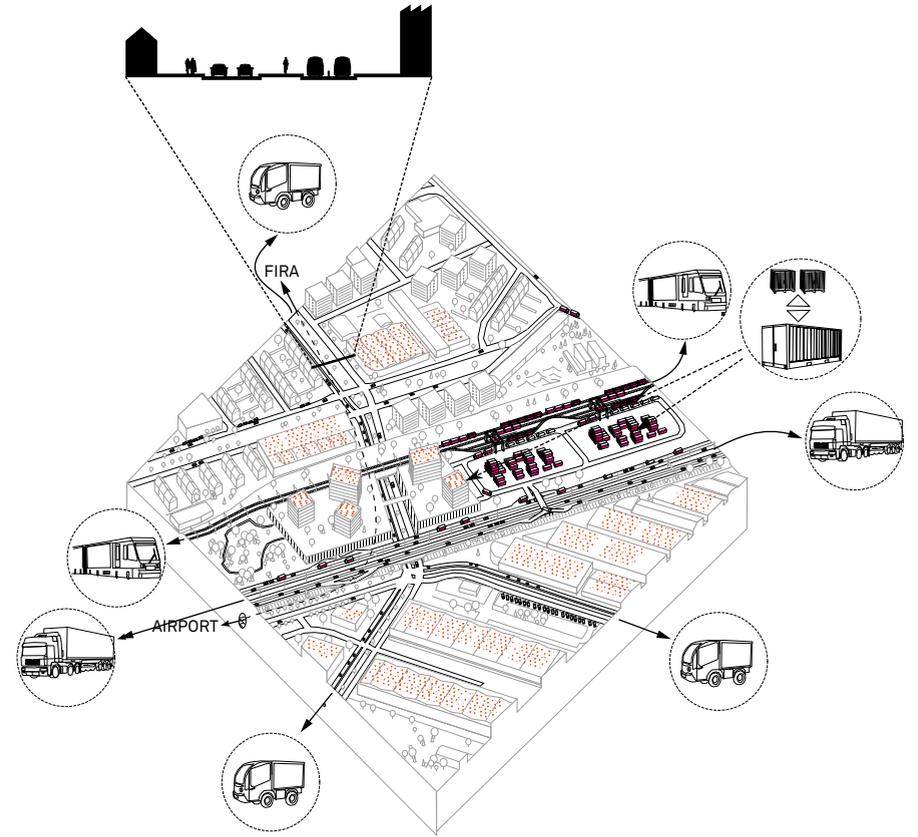
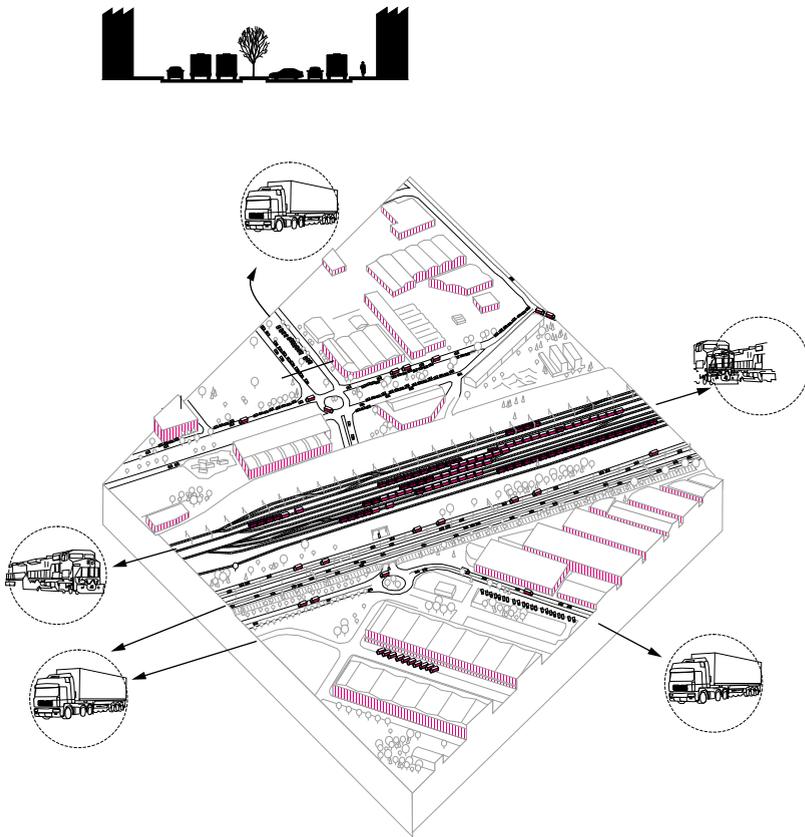


Cogeneration of energy

The area of intervention is linked to the rest of the city of Barcelona. Cogeneration of energy is organized: bio-gas comes from the eco-park and the new bio-methanization plant. Imported gas comes from the Harbour. The Trigeneration plant distributes the gas to the network.

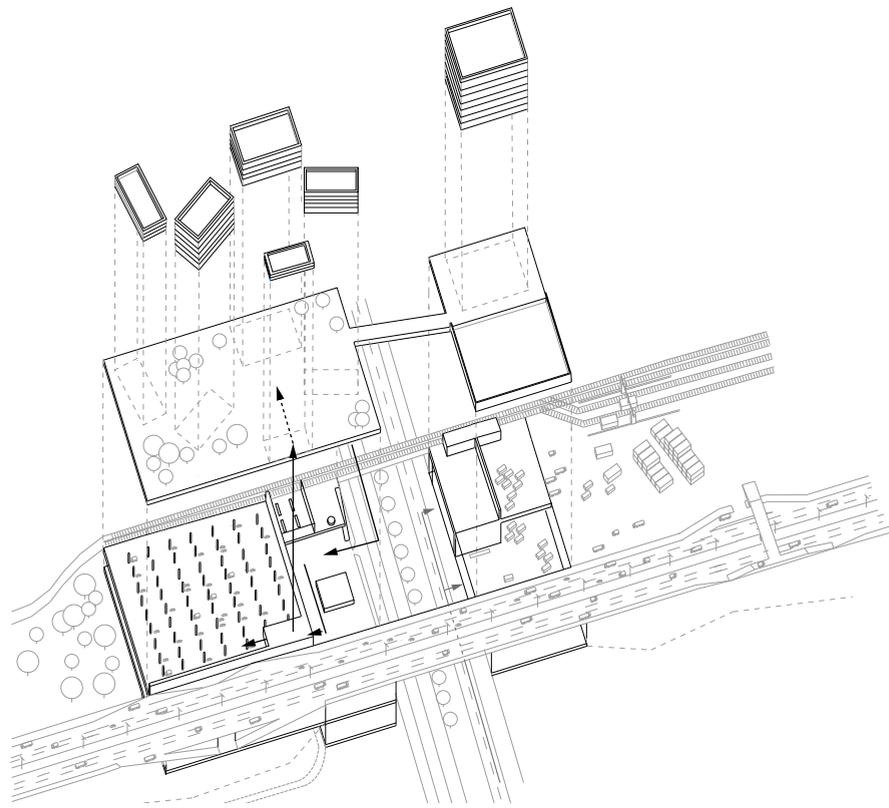
**Hub strategy**

A new intermodal passenger hub and a new logistic centre are created between the Ronda and the railway yard. It will include logistics for big and small containers and a delivery centre.



Hub strategy

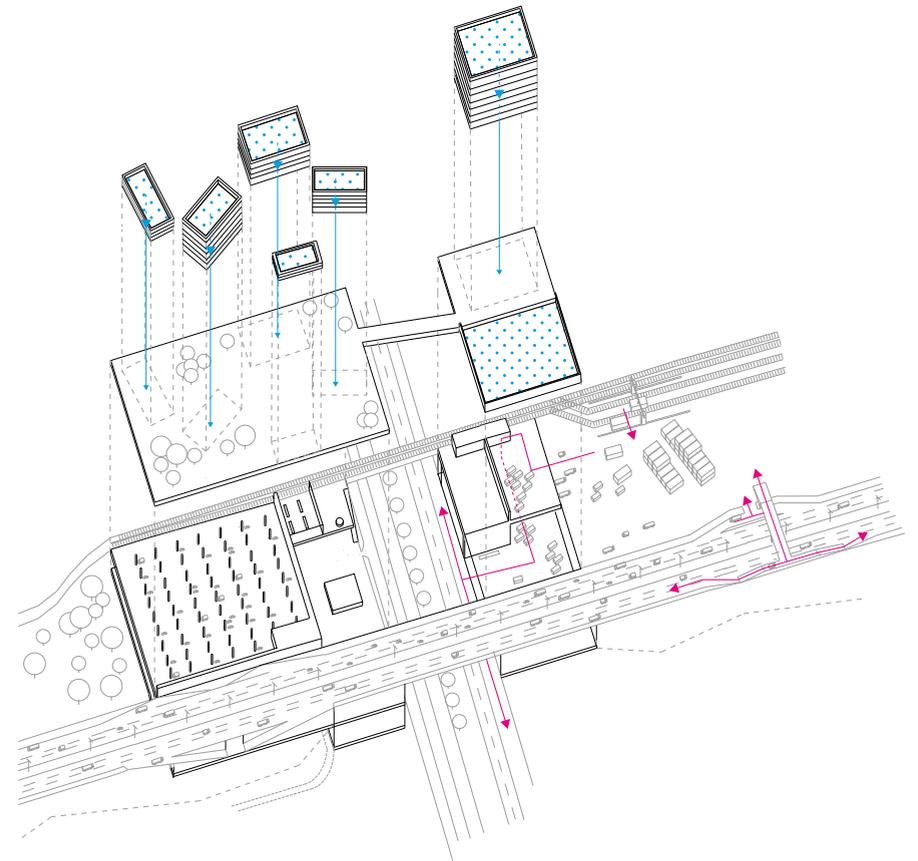
A new intermodal passengers hub and a new logistic center including solutions for small and big containers and a delivery center is planned. The actual road system is partially replaced by an artery distributing the area with electrical inducted transports. Through this solution, the first implementation of residential blocks appear in the northern area.



-  Restaurant (workers)
-  Shops (b city area / workers)
-  Delivery service (industries / b city area)
-  Research center (industries)
-  Metro (residential area / workers / industries)
-  Train (residential area / workers / industries)
-  Offices (workers)
-  Park and ride (residential area / workers)
-  Fab lab (residential area / industries)

Hub development

The hub develops in size as does the residential area. The large roofs of the industrial buildings begin to accommodate water storage solutions and solar panels. Both residential and logistic areas are linked to the large-scale network through the hub and cogenerate water, energy and waste flows.



Vertical density

This exploded axonometry shows the new programmes in the area of the old tunnel. It also shows the flows of people according to their needs. The new programmes are created in order to reconnect the two separated sides of the Ronda. The axonometry on the right page shows the rainwater and material flows in the hub.

SITE D

ZONA FRANCA

THOROUGHFARE

The siting of the end of the Passeig de la Zona Franca gives it a paradoxically dual condition: its logistic relevance as harbour gate coincides with its peripheral position at the rear of the Montjuïc necropolis and at the back of the compact city. Neither industrial nor city, both central and peripheral, a singular fabric created by the accumulation of industries due to its proximity to the Zona Franca combined with smaller housing blocks, garages and factories. The gradual subdivision of plots and industries, and the functional and social mixture stimulated by the upgrading of houses and warehouses have resulted in an urban fabric of heterogeneous depth. Streets and passageways pass through industrial buildings, and shared cargo areas define a multiplicity of situations where formal and informal relationships take place, and where promiscuity between uses is possible.

The recent Marina del Prat Vermell social quarter, the District 38 office cluster, new housing blocks, the arrival of a metro station and the transformation of the Ronda Litoral mark the beginning of a reverse dynamic on the site: resilience and selective replacement of existing pieces encounter the possible arrival of new energy and urban networks. The adaptability of energy devices may transform the operational possibilities of the existing fabric, providing a new foundation for the area and catalysing further hybridization of the urban fabric.

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REGULATE, RECOVER AND RE-USE: A NEW ECO-NODE AT THE FOOT OF MONTJUÏC

Michael Ryckewaert



The Zona Franca thoroughfare area offers multiple design challenges. It is a place where different urban atmospheres come together: the entrance to the Zona Franca, a complex interchange of the Ronda Litoral, the mixed District 38 with workshops, housing and brand new but largely empty offices (due to the crisis), the Marina del Prat Vermell area, partially developed as a new housing district (where further development has also been hit by the crisis), and finally Montjuïc – with its cemeteries spread up the mountain, and the hidden gem of the Fosa de la Pedrera (designed by Beth Galli) – that is very present but hardly accessible from this area.

The richness and diversity offers several clues for a ‘classical’ urban design, and a challenge that is quite different from the other, dominantly industrial areas, where the focus on material, energy and fluid flows requires a more scenario-based approach. At the same time the complexity is high. A key element is to find a solution for the flows of motorized traffic. The presence of the metro line and stops – finished but not yet in operation – offers potential for conceiving the area as a new central point in the city of Barcelona.

The projects for this site start out from a double ‘metabolic’ concern. The first is better **regulation** of traffic flows, while the second builds upon the ecological metabolism of the water and green network.

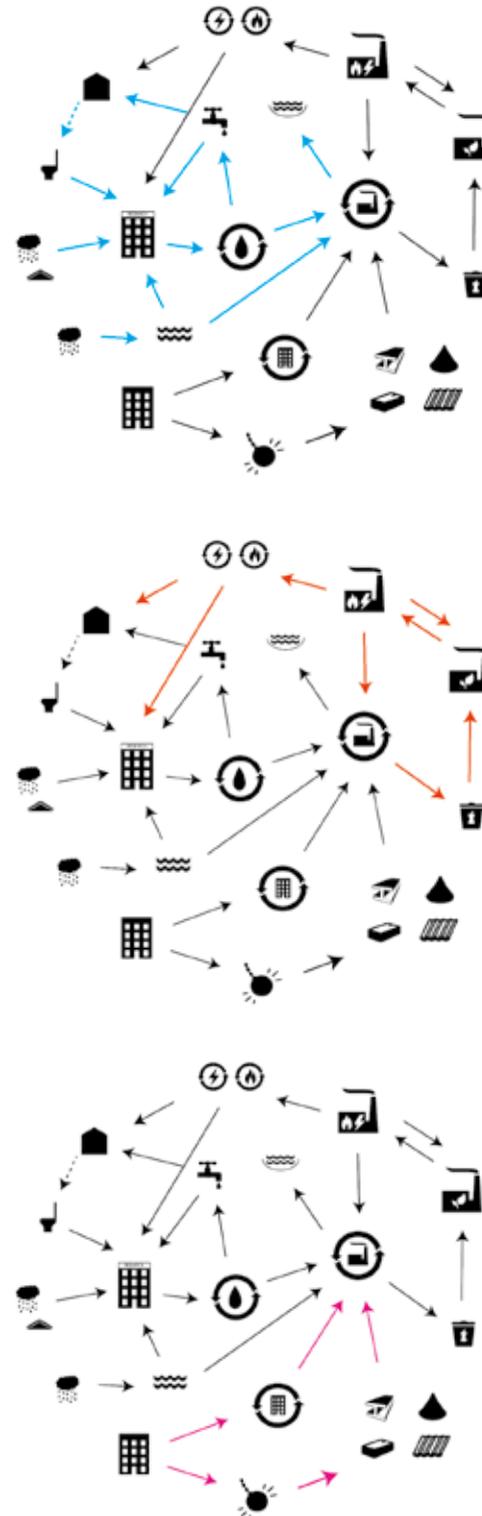
Central to the first concern is rethinking the meaning and character of the Ronda Litoral. This becomes possible as the interchange will no longer be the main heavy transport access to Zona Franca and the Port, and a number of industrial port activities will move to other locations. A new access is planned for near the former Llobregat riverbed, allowing a rethink of the interchange at site D: reducing its complexity, redesigning the railway tracks, and opening up space for ‘slow’ traffic flows of pedestrians and cyclists, and possibly adding a tramway. In combination with the metro stop, a new ‘urban’ hub is thus created in the main transport network of Barcelona, a crossroad on the Zona Franca thoroughfare connecting port, coast and Zona Franca with Plaça Cerdà on the one hand and a renewed Ronda Litoral on the other, and also connecting the Zona Franca and the town of Pratt del Llobregat with the old city of Barcelona. The Ronda, and its newly imagined cycle and tramway tracks, can be conceived as an urban boulevard, repeating in a way the Moll de la Fusta experience.

Central to the second concern is the re(dis)covery of the course of the old Canal de la Infanta a historical canal that played a role in the water regulation of Barcelona. At the same time, part of the District 38 area is located in a topographical depression that is prone to flooding. Both landscape features are located at the foot of Montjuïc, and offer

an opportunity to acquire a renewed role in the water system of the area. The projects mobilize these landscape features to collect, treat and infiltrate water. This is grey water that is collected from roofs and sealed soil surfaces in the adjacent developments, as well as the run off from Montjuïc. Around these water features, an urban park landscape is modelled as an extension and access to Montjuïc.

On this double 'metabolic' canvas – a renewed traffic system and a new water and green system – both projects offer different alternatives. The first proposes the construction of a plant producing heat and electricity, re-using the waste from the area, for a new business and technology campus set in

the wetland park. This would close a gap in the energy network, thus also serving the Port, District 38 and the Marina del Prat Vermell area. The second project places more emphasis on the new park as part of a larger green network along the Ronda Litoral, and would serve as an example for a complete remodelling of the profile of the Ronda. In addition, it capitalizes on the redevelopment, re-use and recycling of the old fabric of the District 38 area, with material recycling, refurbishment and temporary use. In contrast to the centralized energy production of the former proposal, this project aims at a decentralized energy strategy by using rooftops for solar energy production.



GROUP 1:

METROPOLITAN CONNECTION: A LANDSCAPE PLUGIN NETWORK

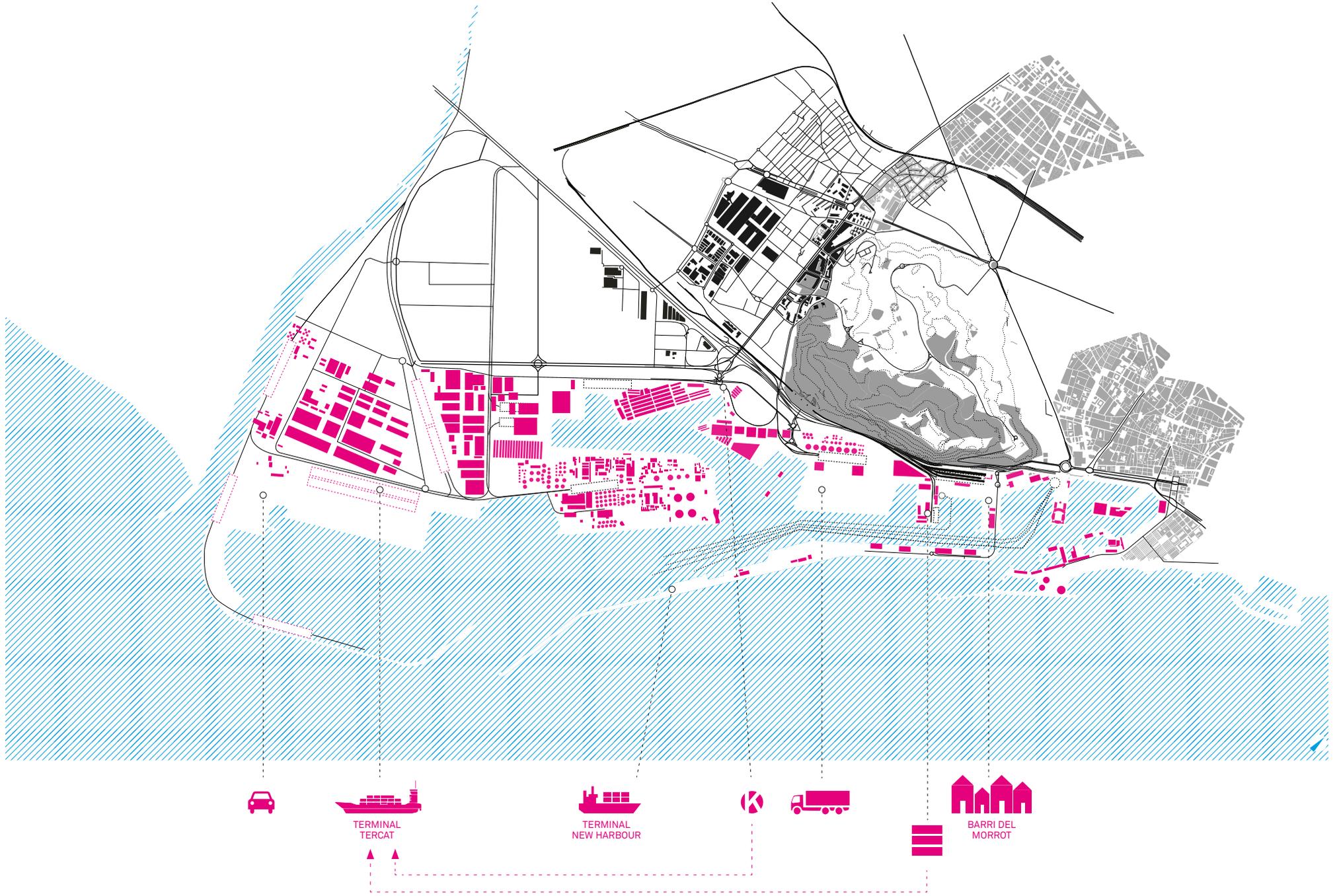
The development of District 38 is key to resolving the issues resulting from its current cul-de-sac status and providing a real connection between the Zona Franca thoroughfare, the harbour and the city. The cul-de-sac becomes a porous space with a new network of roads, access and wetlands, which are still supported by the strong structures of the Ronda and Montjuïc. The proposal extends Montjuïc into the urban tissue of Hospitalet but also into the harbour thus offering a better connection between the district and Montjuïc, which can be crossed to reach Plaza España, and transforms the Ronda from a barrier into a supporting structure for the area.

Two strategies would be put in place so as to make the area more attractive to prospective companies. The first strategy is to simplify mobility; the second strategy focuses on offering an integrated water and energy system. These strategies would provide a landscaped plugin grid network attracting new economic activities.

The Ronda currently acts as a barrier between District 38 and the Zona Franca. The project proposes erasing one exit and simplifying the access to the Zona Franca via a big roundabout under the Ronda, thus linking the different zones more effectively. Pedestrian and cycle paths would link existing roads under the Ronda, allowing users to bypass the roundabout junction. We envisage these paths also linking up with Plaza España via Montjuïc.

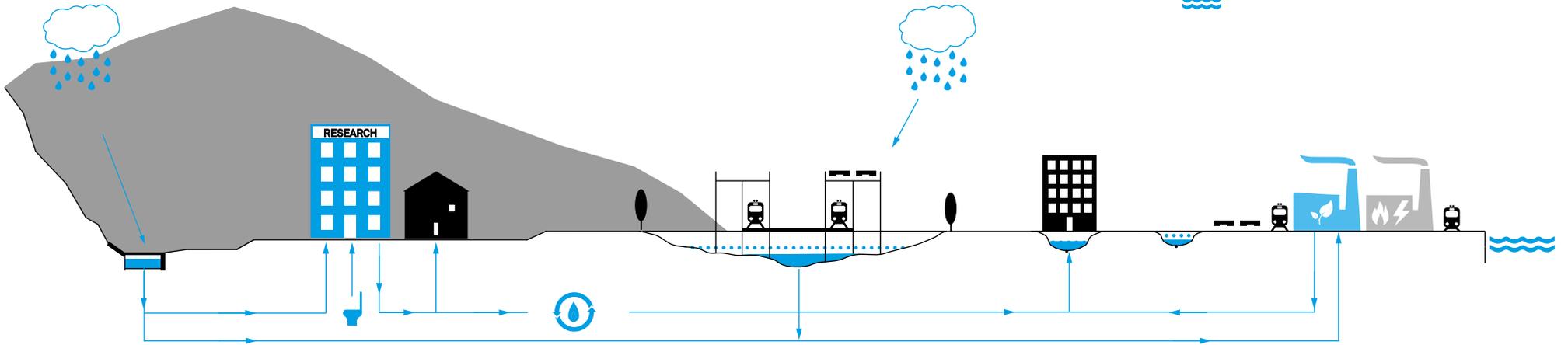
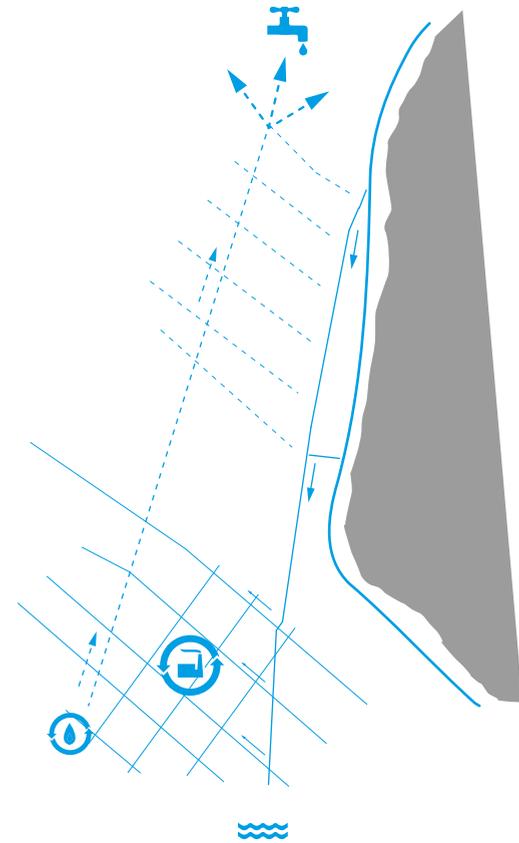
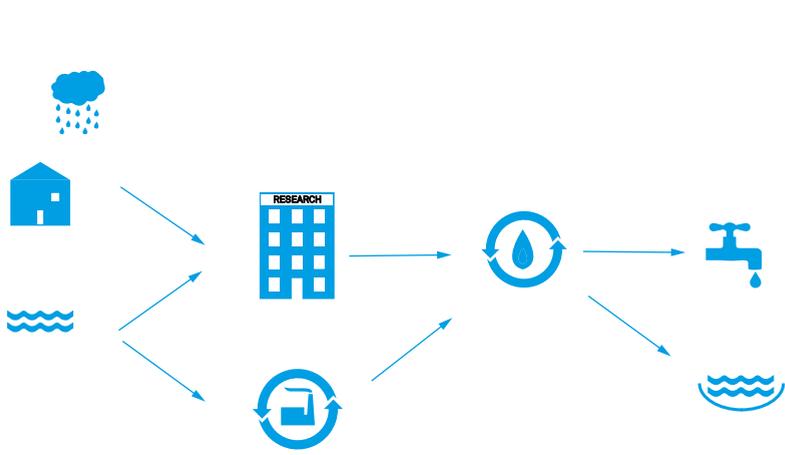
The excavation of the old Canal de la Infanta and the use of natural depressions in the topography for maximal water retention shape the district. The canal serves as a visual reminder of the cultural heritage, but is also an important factor in the future ecological industries that will establish themselves there. The canal collects the water flowing down from Montjuïc, extending Montjuïc into the urban setting rather than creating an abrupt end as it stands now. Water would infiltrate throughout the district creating a wetland campus, which pushes beyond the Ronda barrier into the Zona Franca area. The campus would also be resilient to rising sea levels through floodable basements in new buildings. The wetland campus would host ecological industries that would use canal water or treated research centre water within their production process. Because of the ecological nature of their raw materials, the wastewater would be potentially less polluted than when it arrived. This wastewater could be reintegrated into the water distribution network.

Economically this would be a profitable venture. For the companies themselves, as they would not be producing dangerous waste, their pollution penalty costs, storage costs and energy costs would all decrease dramatically.



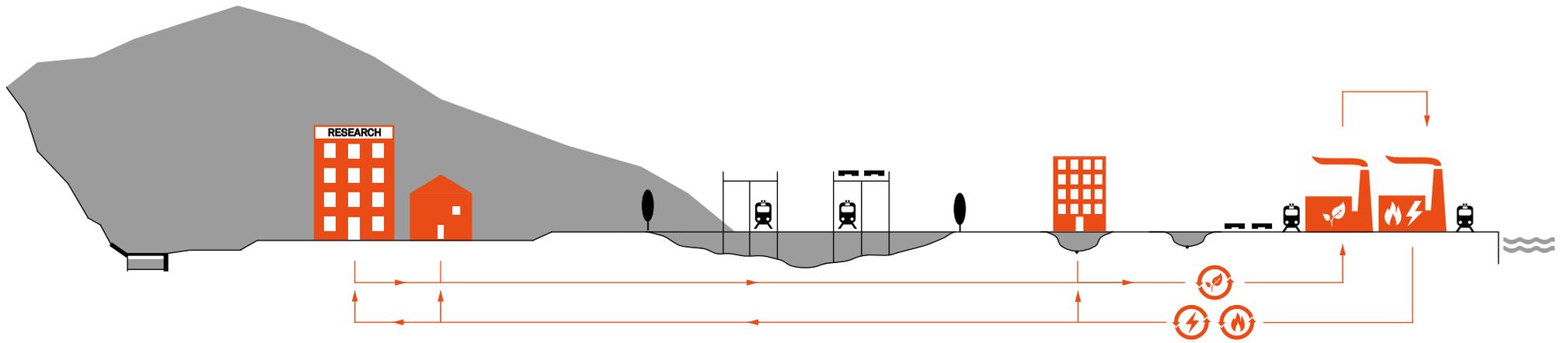
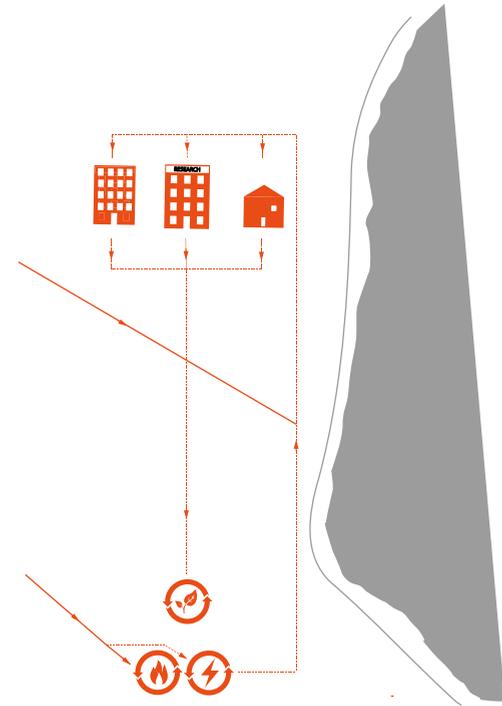
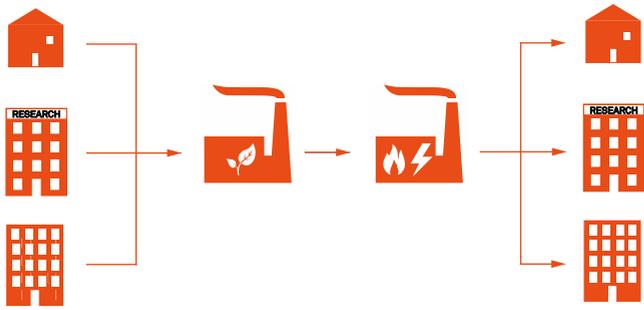
Harbour metamorphosis

This comprehensive mapping of harbour activity shows the potential cogeneration between programmes.



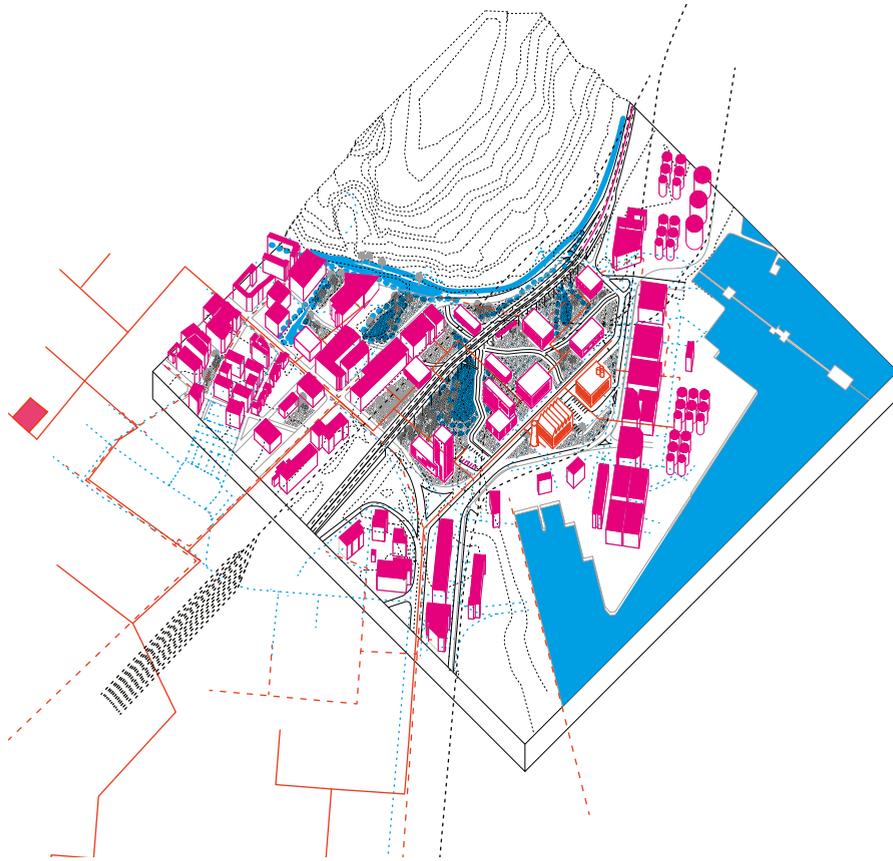
Water ecosystem

New territorial connections between the city, the Zona Franca and the harbour, provide support for water recycling.



Energy plug-in network

New infrastructural connections between the city, the Zona Franca and the harbour, provide a landscaped plug-in network for industrial ecology and energy reuse.



Metabolic campus

The Ronda and Montjuic are strong infrastructural barriers, isolating the entrance of the Zona Franca. A highway exit is removed in order to emphasize use of soft mobility on the site. The open space allows for absorption of water and turns the area into a wetland campus for new industries.

GROUP 2:
THE MISSING LINK:
RECONNECTING
THE TERRITORY

When planning for a sustainable future, the city needs to think of nature as a form of infrastructure. The proposed Green Corridor would generate a visual and physical link between the main green structures of Barcelona, stretching from the Besos to the Llobregat River.

In order to open up the area and guarantee its integration in the urban fabric of Barcelona, the green spine would promote slow mobility throughout the different patches of the city, including District 38, situated between the Passeig de la Zona Franca and Montjuïc. Another advantage is that a green infrastructure would organize urban ecology and satisfy important urban needs, such as water retention and storage, a cooling effect, recreational areas, a slow traffic connection – and this all the way to the Llobregat river.

Accessibility by metro and slow roads are essential elements to foster a successful future for the urban integration of the Green Corridor. The existing metro line would be fully exploited. The old railway would be demolished, and replaced with a slow traffic lane that connects with the city centre. In the near future the main entrance of the port would be moved towards the Llobregat river. The large existing junction would be reduced in size, thus offering a new floodable buffer zone between the district and the port.

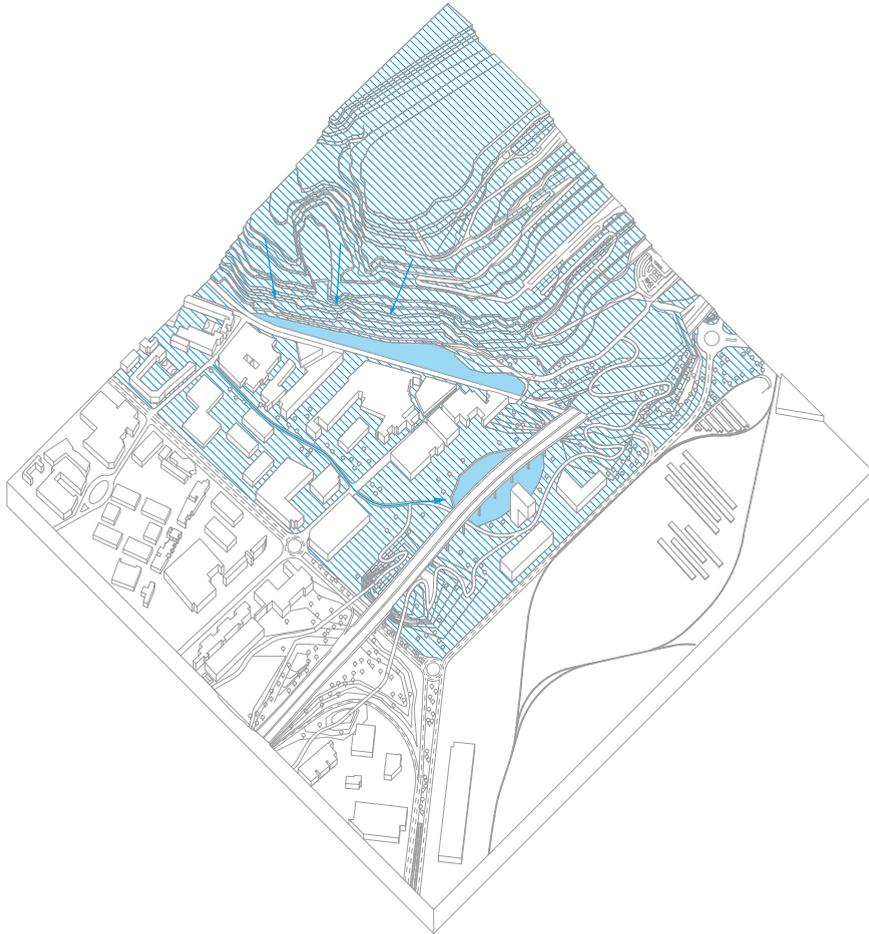
One of the main ideas is to reduce the heavy traffic flows at the entrance of the Zona Franca. This would open up the zone to pedestrian and bicycle flows. The new design of the road structure would allow the exploitation of new patches of land currently occupied by the harbour – District 38 being one of them.

The advantages of being directly connected to the Green Corridor would open up new possibilities for the development of District 38. Suffering currently from the economic crisis, its social and economic problems cannot be solved by new infrastructures alone – as all the large-scale real estate projects have been shut down. The district has to define, activate and reconnect itself on multiple scales, without relying on large investments.

To revitalize the area our strategy focuses on the re-use of city waste (abandoned bikes, second-hand furniture) to create low-skilled jobs. The large underused warehouses, the empty plots and office buildings in the area would serve as workshops and retail centres for recycled goods such as construction materials and discarded furniture. And finally, the Green Corridor would connect District 38 to the city centre. Rather than being regarded as a cul-de-sac next to Montjuïc, it will gain a central position in the city.

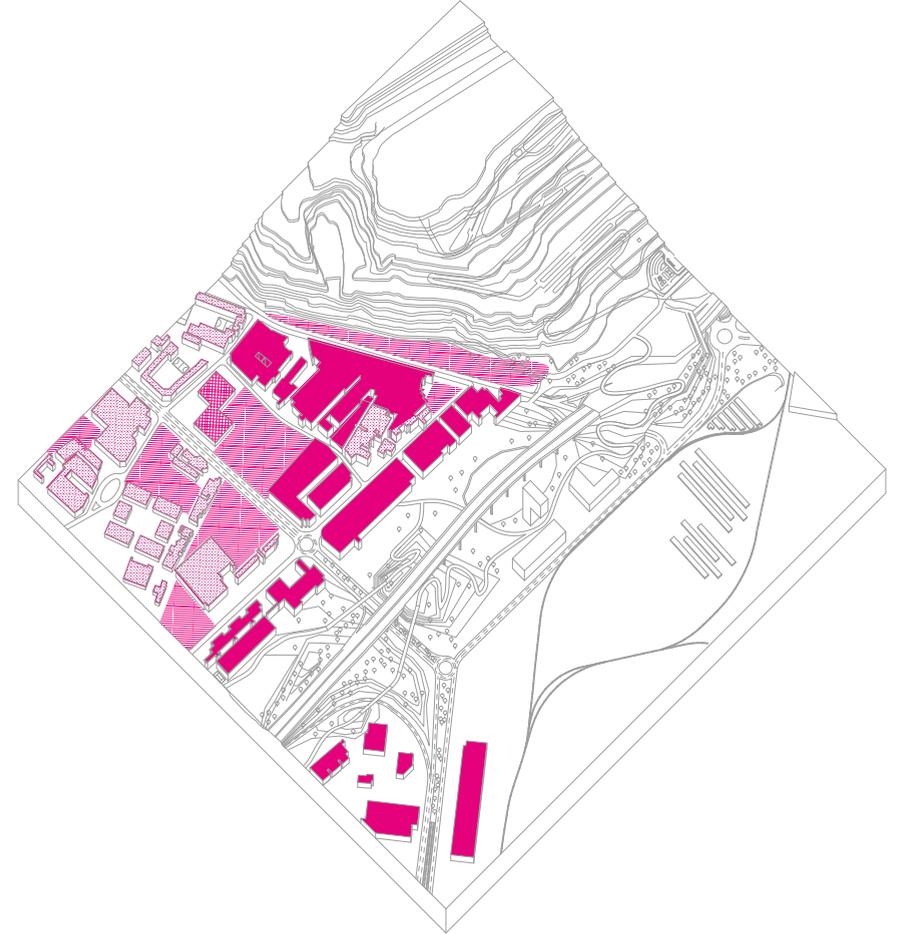
**The green spine**

When planning towards a sustainable future, the city needs to think of nature as an infrastructure in itself. It already manifests itself in this existing first part of the green corridor, but it is important to promote its development, in order to reconnect the territory towards the Llobregat.



Water management

The new infrastructure organizes ecosystems and satisfies important urban needs, such as water retention and storage, and cooling. New floodable areas are created around the green corridor and help organise the local and regional flows.

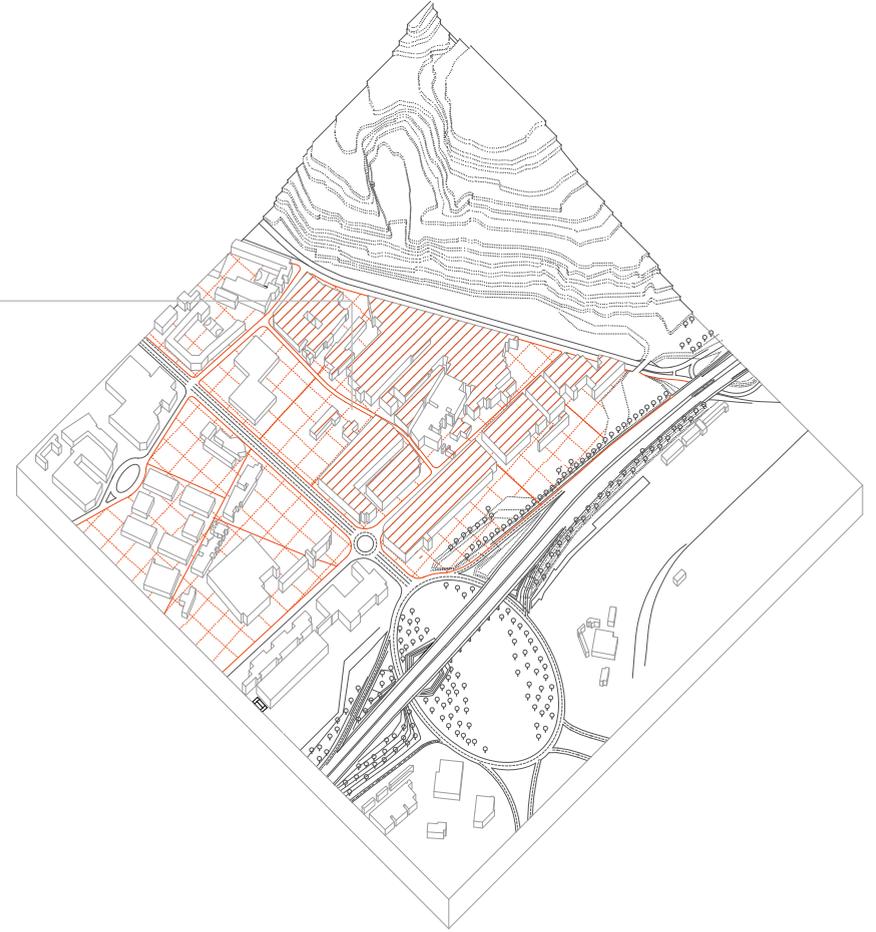
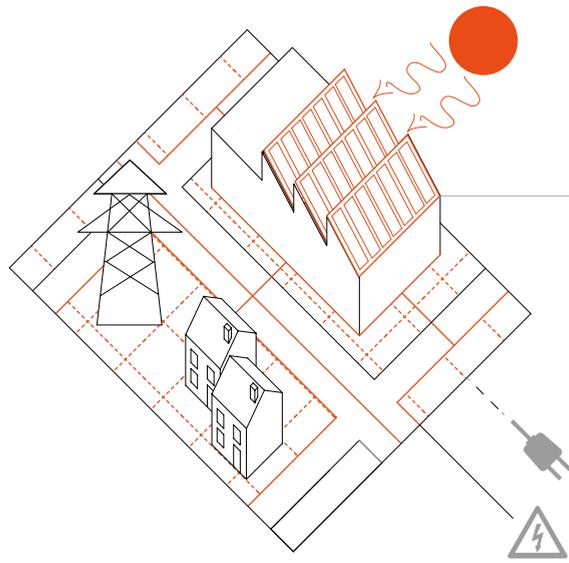


-  Offices
-  Housing
-  Stock and sale
-  Empty spaces

Densify

When thinking about densifying the district, one needs to respect and keep the mixed character of the site.

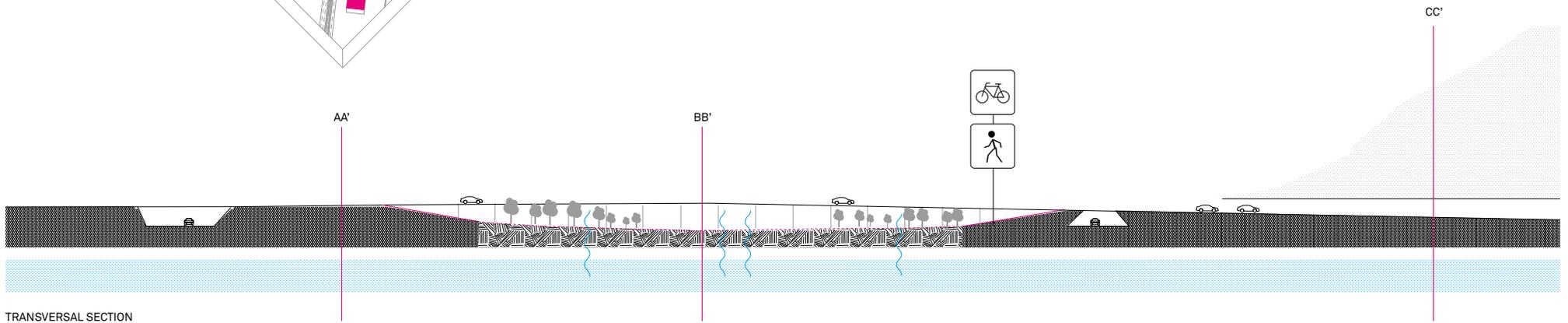
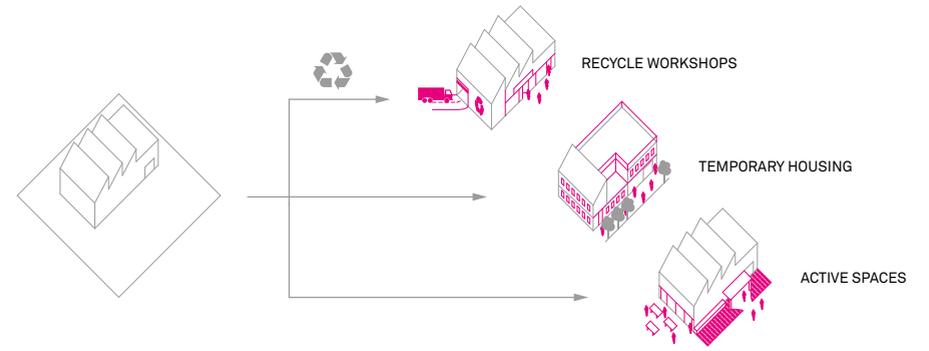
NEW ENERGY CYCLE



- Primary energy grid - Natural energy
- Secondary energy grid - Grid that follows the new urban division
- Available roof area - Old buildings reused like generating station for surrounding housing areas

The energy grid

The energy grid should not exist on its own, solely for the district itself. The goal is to make the grid penetrate through the corridor to reach the port area. The energy cycles work together in order to optimize their performance.



TRANSVERSAL SECTION

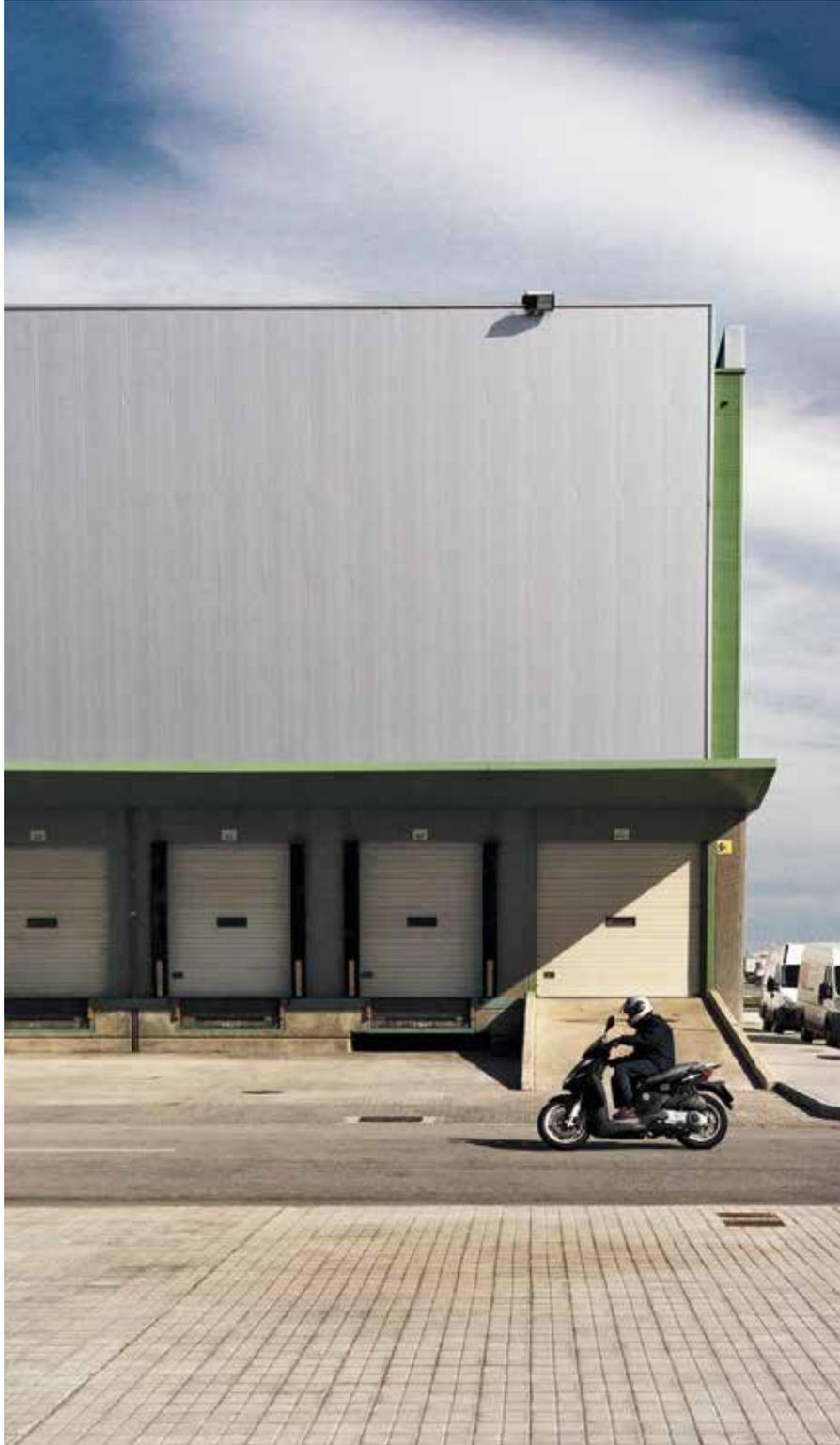
Short term and long term

The short term project for the district 38 foresees the integration of urban ecosystems using the green corridor as a backbone. In the long run, the zone will transform and opening up to the port area even more, exploiting the notion of continuity and permeability to its fullest.

Permeability

The large existing road junction will be reduced in size, thus offering a new floodable buffer zone between the district and the port.

READINGS



POST ZONA FRANCA: LIMITLESS OPPORTUNITIES

Carles Crosas and Jorge Perea

Since the arrival of Seat in 1957, the Zona Franca, in combination with Barcelona's free port, has been a metropolitan and national driving force that has made a strong imprint in economical and physical terms. Its effects in stimulating Barcelona's metropolitan growth, welfare and development contrast highly with its closed condition as a tax-free area for the goods and merchandise entering and leaving through the port. Conceptually, the model provided a wealth of opportunities but avoided local narrative: large scale in the metropolitan sense without local interference.

Historically, the Zona Franca can be regarded as a replication of the 19th century industrial logic of the Poblenou neighbourhood, located next to the Besos river: isolated enough to avoid social conflicts but near enough to benefit in terms of labour and housing. The Fordism models of the 1970s to the late 1980s reinforced the Zona Franca's proximity and isolation paradox: high specialization of space and opportunities within an entropic narrative in the city as a whole. Spatially, this was articulated through the multiplication of enclosures and connections at systemic and local levels. The strengthening of links with the arterial road network (1970s) and the metropolitan coastal ring road (1990s) for freight transportation and private car access exemplified this model of increased and specialized accessibility. Mercabarna – southern Europe's major food logistics area – on the other hand stands as model of spatial subdivision at a particular level: urbanization within enclosure, mirroring a broader scale model. More

recently, the new BZ quarter replicates, with its multiple roads offset from the existing ones, the historic model of subdivision and clusters but provides openness in character with functional separation.

Based upon this model, functional optimization and spatial organization were the key elements employed to enhance industrial and logistic productivity and to provide added value to the industrial location. Within this reasoning, and operating as landlord, El Consorci de la Zona Franca has historically provided roads, connections and services to encourage industrial and logistic activities to establish themselves: expansion in size and performance was the growth model of both the Port and Zona Franca until they exhausted their own physical limits.

The appearance of the office skyscrapers on the Plaça Europa and Barcelona's exhibition halls (Fira) on the Gran Via represents the latest evolution of Barcelona's metropolitan area. The territorial insertion of major infrastructures (a new airport terminal, international standard gauge railway reaching the port, TGV, improvement of road networks) together with the progressive evolution of industrial areas mark a more complex transformation, overcoming the traditional models of space rationality and functional efficiency. Urbanity is the final value.

The recent transformation of the old Seat area into the BZ quarter exemplifies a willingness to embrace economic diversification and attract more knowledge-oriented industries, offering room to activities that actively seek advantages beyond location in the social diversity of the compact city. While the metropolitan checkerboard is strongly shifting, some actors continue to play the same role.

Against this background of rapid change in Barcelona's metropolitan region, the Zona Franca's 600 hectares, in a splendid location and with good accessibility to major networks, now open up the debate on how local opportunities can be taken into account within the regional context. Which programs should be stimulated and attracted? Which urban

models should be implemented? How can value be added without displacing the industrial critical mass of the area?

THE ZONA FRANCA INTENSIVE PROGRAM

The Intensive Program held at the Zona Franca took this paradigm change as the potential foundation for building a discussion on the major role of these areas in relation to the metropolis. If urban metabolism and co-generation remained as arguments for discussing the physical connection and arrangement of urban flows, overcoming its entropic character at a broader scale was implicit in the question.

The two weeks of debate between academics, experts and architecture students at ULB, IUAV and ETSAB stressed that the possibilities of building new interdependencies with the metropolis are crucial, not only to diversifying the economic possibilities but also to stimulating new processes within and around the Zona Franca. Potential opportunities were detected, at both systemic and strategic level, which may open up new possibilities for the area to retain its very implicit industrial character.

SPACES OF RE-FOUNDATION

Strategic areas were highlighted at junctures between administrative domains, new and old boundaries, and existing and new infrastructures. These are places where the Zona Franca model can be rebuilt by considering new externalities. These are spaces that allow for mental, programmatic and conceptual re-foundation of the Zona Franca model.

Metro corners, metropolitan crossings: Junctions along the new metro lines (L9 and L10) could stimulate the creation of places where industrial logic meets broader consumer demand, helping enhance urban consciousness in these places. Here size will be optimized through a programmatic opportunity and the city will make inroads within Zona Franca.

The metro junction at the BZ quarter opens up options for specialized trade and manufacturing – electronic and computer outlets for instance – combining logistics and

production, and offices with music production and night-time leisure activities at the metropolitan scale. These were proposals that combine fluctuations in use with opportunities for flows: metropolitan metabolic adjustment of time and space.

At the same location, diverse new programs were proposed, taking advantage of the cold re-gasification network programs: a sky dome complex combining sports clothing with logistics and sub-distribution companies; the food sector profiting from synergies with Mercabarna. Here the opportunity lies in entwining public vision with metabolic networks.

Other territorial and administrative junctures, linked with the general structure of main streets and avenues, also open up the possibility of hybrid domains: spaces of contact and continuity where conceptually new programmatic choices can be made. If the most apparent one is at the road junction between the city, the Zona Franca and the port, at the end of Passeig de la Zona Franca, a new one could be defined at the crossing between the new Bellvitge hospital, Biopol, and Zona Franca

Initially, synergies between port, city and Zona Franca could be reinforced around the traditional entrance from Barcelona and the business model reinvented here: maximum centrality derived from its accessibility and high interaction between actors. Subsequently, addressing the link between Bellvitge's new medical Biopol and Zona Franca, which are at present adjacent but separated, may stimulate clusters of new industries and programs of more complementary value.

Newly proposed infrastructures would reverse boundaries and limits, giving peripheral spaces a central feel. The space to the rear of Mercabarna, at present used for parking purposes, could achieve major importance if the rail and road port accesses were relocated along the former Llobregat riverbed. Strategically, the freed-up space could be used to radically reorganize Mercabarna's food logistics model

(along the lines of Greenport in the Netherlands), optimizing the benefits of rail transportation and proximity to seaport and airport, and consequently diversifying business and services. At the same time, the proximity of the artificial wetlands along the Llobregat river and the attractiveness of activities associated with this could lead to the creation of an 'economy of experience and knowledge', yet to be exploited at Mercabarna: global metabolism combined with ecological sensibility.

FROM SYSTEMIC INTENSIFICATION TO BOUNDARY ADJUSTMENT

At the systemic level, opportunities to overcome the boundary effects of road and rail infrastructures could be established at larger and smaller scales. In a metabolic sense, metropolitan infrastructures and systems could provide a broader logic of interconnection between the city and the Zona Franca, thus blurring its differentiated character. Natural systems and metabolic networks become major actors in this scenario. On a smaller scale, logics of intensification and permeability could open up new local connections, stimulating new synergies, ecological advantages and new urban experiences.

At the large scale, the possibility of extending and joining up Montjuïc's natural systems might strengthen urban continuities, imparting sense to activities in the ill-defined fringe between the port and the mountain, visually linking harbour activity with urban uses.

In terms of ecological space, some facilities could be scattered in conjunction with wetlands and marshes. As a natural system, the visual enjoyment of port activity would fulfil the desire to link up the historic city (la Carbonera) and the Zona Franca through linear structures (park+road+Ronda).

At the intermediate scale, the proliferation of connections between the Zona Franca and Pedrosa Industrial Polygon or Bellvitge housing estate could add coherence

and connectedness to the position of Plaça Europa and La Fira, and the new settlements planned for the area. Spanning Can Tunis Rail Park and Ronda Litoral, intensive new relations would become possible between the north (fine grained, logistic based) and south (coarse grained, industrial opportunities) sectors.

Here metabolic networks, such as those of services and facilities, play a major role. While these are usually related to large facilities and enterprises, they could be connected to smaller industrial and entrepreneurial tissues, creating a sort of 'Marshallian metabolism'. Cooling infrastructures serving simultaneously the large and the small, mutual sharing of flows and energies between clustered activities. This is an urbanism of lines and connections, of axis and ramifications.

At the plot scale, the thickness of boundaries becomes the major protagonist for intensifying central activities in close connection with borders. The boundary between the entropic and closed logistics could become suitable for re-working as a permeable filter, membrane or space delimitation. Among others, the boundary between the Zona Franca and the port represents an opportunity for mixing nautical programs – cruise support or World Race logistics – with open access from the Zona Franca and internal and segregated port distribution. The perimeter of Mercabana, widened by stacking parking space, could open up room for subcontractor companies for by-products.

Behind these opportunities lies the necessary consideration that piecemeal urban approaches and administrative regulations are most useful in standard contexts where development under firm guidance is the key. The traditional use of planning regulations, which tend to 'regulate' the aspects of form, plot, alignment, built profit, ratio, intensity and type of use, will have to open up to the possibility of understanding these same aspects in a more dynamic and less fixed way: ideas shaping alternative planning tools. Here, campus-like structures stand in opposition to plot

subdivision and regulation techniques: territory piece by piece.

In the Zona Franca, the question of urban potential remains open: big opportunities (a new 'Nissan' or 'Amazon') or small-scale subdivision? Specific industrial and logistics programs, or open and non-specific industrial ones? Is it possible to re-found the city and give a new urban sense to the Zona Franca, whatever the answers may be? Dealing with such an open scenario is surely one of the greatest challenges in the Zona Franca.

This is a field composed of processes of urban character rather than final images of a built-up landscape; of the logics of replacement and substitution; of introducing new elements and intensifying the existing... At the core of this lies the question of whether will the Zona Franca become part of Barcelona's urban consciousness and recognized as such in terms of metropolitan use and citizen's appropriation, yet without losing its industrial character? In the end a city, for sure. But not the city as we know it.



ZONA FRANCA: MATTER AND ENERGY FLOWS

Marc Montlleó

The Zona Franca has always been productive land. Its location in a river delta has made it a truly productive location for centuries. Deltas are places to which matter is carried by the water system, usually making them highly productive. Indeed, they tend to be places of great biodiversity, as different systems of bodies of water often meet there. The Llobregat river, wetlands, small temporary lakes, drainage channels and canals are all systems through which water and energy flow. They produce large amounts of biomass and provide a home for many species in and around the various ecosystems.

As is the case for many wetlands, humans turned this one into agricultural land, replacing the wetlands productivity with fields of crops. It became an agricultural area within the orbit of the municipalities of Sants and Hostrafrancs in Barcelona on the other side of Montjuïc. The conversion process resulted in the loss of natural ecosystems and, as in many other deltas, ponds and lakes dried up. Water was rerouted to increase agricultural production, being carried through canals and irrigation ditches to where it was needed for farming.

This was the start of the first matter and energy-cycle transformations. Incident radiation and the water in the Llobregat delta's complex system were no longer used just by the coastal wetland habitats. Human conversion of these into agricultural land refocused the matter and energy cycles on crop production. As this agricultural transformation was brought about, settlements began to appear, linked to two primary activities: agriculture and fishing. The first agricultural villages were established at the beginning of the last

century. It was not until the middle of the 20th century that industrial developments and housing for factory workers were built. Industry came in search of valuable resources: large expanses of land, water, removed from urban areas and with a connection to the road from Valencia. The area behind Montjuïc and the left-hand half of the Llobregat river delta met all those needs and was very close to Barcelona central market and the port.

The matter and energy cycles changed once again. The effect was greater this time as the building of manufacturing complexes transformed the land in a way that required more stored energy, while sometimes considerably changing the land surface, making it waterproof. Indeed, the changes to the water cycle brought about by building industrial facilities were far greater than the switch to agricultural use. Energy requirements also changed considerably. Water became a source of energy and fossil fuels such as coal began to be used. Factories covered large areas of land and estates grew up around them to house the people who worked there. Blocks and units in this part of the city were unique in size due to these industrial origins. However, the main impetus behind the area's transformation came when SEAT set up a vehicle factory there covering more than 50 hectares. This was the catalyst for the creation of the Zona Franca industrial estate as we know it today. This also changed the land use and the matter and energy cycles.

Zona Franca is the largest industrial estate in Catalonia and it has an exceptional location, next to Barcelona's port and very close to Barcelona airport (el Prat) and the traditional centre of the Barcelona metropolitan area, which is home to over 3.2 million people. So one could say it is a unique and strategic site. As mentioned, many of the matter and energy cycles have become artificial; they have been disconnected from natural cycles to a large extent. The land surface is now mostly waterproof. Over the years industry has polluted the land, as in other places of this kind. However, it is not just the land that has been polluted; the aquifer

has often suffered the consequences too. Some industrial facilities still use the aquifer as a resource but most of them are now connected to the mains supply. Groundwater has become salinized and polluted in some places (with heavy metals and oil products, etc.). The water supply system is now completely artificial and energy dependent: drinking water treatment plants, purification plants, pumping stations and the desalination plant cannot operate without energy.

Energy consumption has certainly been transformed too in recent decades. The shift to a service-based economy and the predominance of the logistics industry means that there is less demand for energy from businesses in the Zona Franca. Few of them still carry out production activities there although some remain. Most companies there are in the logistics business. In this case, energy is not consumed in Zona Franca itself but instead along the transport routes. Even so, the energy required by activities based in the Zona Franca is mainly produced exogenously. In other words, fossil fuels are consumed (mainly gas) or power comes from nuclear power plants. The energy mix actually depends on the market and the renewable resources available at any time. However, energy no longer comes from this half of the delta, but is instead produced in combined-cycle, nuclear or hydroelectric power plants.

The Zona Franca is powered by grids. The area's resource use has changed over time from using local resources in terms of land, water and sunlight when it was an essentially agricultural area, through being an industrial area that needed land and water from the delta, to logistic activities, which mainly make use of materials from around the world and are supplied by grids and networks. Can we reverse some of this exogenous dependence and make better use of the industrial estate's water and energy cycles? Can we use the surplus energy from production processes more efficiently? How can we make the metabolism of this industrial area more efficient? Can we work with industrial ecology systems? Zona Franca faces the challenges that are typical of industrial areas.



CHALLENGES FACING THE ZONA FRANCA

Maria Buhigas

The Zona Franca is one of the largest tracts of industrial land not only of the city of Barcelona, but of its entire metropolitan area: over 500 hectares of public land managed by a consortium composed of representatives of the central state and the city of Barcelona, the Consorci de la Zona Franca. The area is located to the west of the city centre and is part of the Llobregat Delta, an area characterized by its concentration of major infrastructure, which includes the port and airport and other smaller areas of industry and logistics activities. From the air, the Zona Franca appears to be a continuation of the rest of the city, yet at the street level, the road and rail infrastructure surrounding it creates a physical barrier that isolates it from its immediate surroundings. Planned originally as a free zone, the Zona Franca never got to operate as such. Initially, it housed the largest car factory in Spain, SEAT, a symbol of economic prosperity from the time of the Franco dictatorship, and the Spanish equivalent of Ford.

Today, the Zona Franca accommodates a range of activities and companies of all sizes. Highlights include the presence of Mercabarna, the main food wholesale market in Catalonia, a logistics park, industrial (chemical, pharmaceutical and printing, among other sectors) and office buildings of various public and private companies of note (including the Abertis Group headquarters and the Metropolitan Area of Barcelona Authority). In its heyday, the Zona Franca hosted more than 50,000 workers.

Today, the economic crisis is visible in the streets of the Zona Franca, as it is in other industrial areas of Catalonia.

Empty lots and industrial buildings listed for demolition await new opportunities and better times. Within this context it seems appropriate to focus on the Zona Franca in an urban design workshop and to do so in terms of urban metabolism. As my contribution to the workshop, I would like to introduce two issues into the discussion and reflection on the challenges facing the Zona Franca: the scales of metabolism and manufacturing areas and urban design.

SCALES OF METABOLISM

Integrating aspects or issues of metabolism – such as flows of matter, energy and water – in an urban design exercise for the Zona Franca we should allow for the possibility of introducing different scales of reflection. The characteristics of the Zona Franca and its particular territorial context offer many possibilities if this reflection is carried out from a global perspective. Discussion on urban metabolism often tends to descend to the small scale, looking for design solutions to improve the management of the above-mentioned streams: wastewater collection, alternative power generation systems, heating and cooling districts, etc. However, the solutions put forward often become the mere repetition of learned formulas that do not necessarily respond to the specificity of place.

In contrast, if we observe and analyse the Zona Franca on a global and wider scale, we can create the scope to perceive and understand its metabolic function at the metropolitan level, for instance. Such an exercise is closer to a strategic approach than to a design one, and will reveal the existing relationships between the Zona Franca and different areas within a larger territorial context. This may seem a trivial exercise, yet it is not.

One result of this exercise could be to identify where there are places of opportunity to act, either because the relations are already in place, but weak, or maybe because they do not exist but there is potential. In short, a map of opportunities on which to operate, linking strategy with design. For example, on the one hand Mercabarna, the main wholesale

market, is clearly a key element for Barcelona's metabolism, on the other Parc Agrari, the biggest agricultural metropolitan area, is located nearby, but there is no link between them. Would it be possible to 'create' conditions by design to encourage this? Another result of the same exercise might be to identify the role that the Zona Franca plays within its global territorial context. And thus design a strategy to reinforce its position, which brings me to my second point.

MANUFACTURING AREAS AND URBAN DESIGN

We have witnessed the transformation of large urban industrial areas under the pretext of obsolescence and the pressure of a real-estate market avid for more profitable uses. However, we have neglected the fundamental value of these spaces to accommodate activities that have no alternative sites in central urban areas. Moving these types of activities – production, manufacturing, distribution – away from the centre would undermine the metabolism of any city. We seem to have banished the value of urban design from industrial spaces, due to a misperception that production occurs in remote parts of the world.

No one would argue that, in a globalized world, the meaning of so-called traditional manufacture has changed. However, we must demand that these spaces – the Zonas Francas (the industrial areas) – still have potential to host activities that do not match the stereotype of hi-tech neighbourhoods where corporate office buildings are crowded together.

It is not easy to work in the conditions that the workshop is proposing and there are no references. Urban design has paid little attention to industrial environments and even less to urban metabolism considerations until recently. Therefore this is a great challenge, which requires fresh approaches, with no prejudgments whatsoever. It is time to discover the nature, the quality and potential of these spaces that have historically been isolated (due to use segregation) so that we can integrate them into the rest of the city, and metabolism could be the argument in favour of this.



TOWARDS SUSTAINABLE URBAN DRAINAGE SYSTEMS

Roberto Soto

Water is one of life's vital elements. We often take it for granted though, underestimating its great importance, and fail to take it into account adequately when designing our cities. Our design efforts only consider the logistics of water, instead of deploying a holistic approach to it. Even worse, we leave all water-related matters in the hands of engineers.

The urban fabric and the accompanying utilities form a thick, waterproof skin, which interferes with the natural water cycle. This situation could be remedied and even avoided by means of better design of our public spaces. Returning to the problem at hand: as rainwater falls onto the artificial skin, it creates a surface run-off, carrying various types of contaminants, flowing out of the city and into the natural environment. This obviously helps to rinse the city by tossing out the dirty water. But if we consider the hydrological balance scheme that this implies, we see that water passes through the city, turning into a contaminated liquid, and is then returned to the natural environment.

An additional problem that this waterproof-skin can create is flooding. In Mediterranean climates where precipitation can be very intense, flooding can cause minor inconveniences but also big disasters. A unitary water management system, which collects rain water together with sewage water, is actually at the root of the problem: the growth of impervious surfaces in the urban context has resulted in this system, inherited from the Romans, being unable to handle the huge quantity of water run-off. The sewage system is designed to bring black water to a

wastewater plant. When it rains, the water overflows and goes directly into the sea, mixed with sewage water. Again, the result is the contamination of the recipient environment. Some engineering solutions have been devised to solve this problem, such as storm tanks, or enormous water deposits sited beneath the city, used to collect rainwater to avoid flooding. These engineering solutions are usually very expensive, both in construction and energy terms, and do not really represent a solution in terms of sea contamination. Nonetheless, they have become common in many cities.

Back to Barcelona, a city where 48% of the urban surface consists of rooftops. A large percentage of the metropolitan surface area is green, but this green is located outside the city, on the Montjuïc and Collserola mountains. One way of increasing the green surface area within the city could be to build sustainable drainage systems: we could turn the inert rooftops, part of the waterproof-skin that spills contaminated water into the recipient environment, into a green sponge that manages rainwater in a passive and sustainable way. The sponge holds the rainwater, returning it slowly into the environment through evaporation. Technical issues are not a problem here. The only real difficulty is that people fail to recognize an inert rooftop as a source of contamination, while regarding the maintenance of green surfaces as a nuisance.

At the street level we have other solutions. The idea is to perforate this impermeable skin, and create green points of communication between the rain and the subsoil. Usually we try to manage water by making it disappear, but rainwater can also become a landscape element, present in public space. The project compiled here, aim to consolidate sustainable urban drainage systems as an alternative to traditional form of water management in Barcelona.

A VENETO PERSPECTIVE: LEARNING FROM DIVERSITY

Maria Chiara Tosi

Because of the many substantial differences between the two territories, looking at the Zona Franca from a Veneto Region perspective might seem to be a contradiction in terms. While the Barcelona metropolitan area is one of the most dense and concentrated in Europe, the Veneto region is one of the most dispersed and extensively urbanized. Despite this, a more in-depth knowledge of the relation between productive patterns and the territory in different territorial contexts, such as that of the Veneto region, can help to better address the on-going transformation of the Zona Franca in a way that could help it to be economically sturdy, socially inclusive and environmentally resilient.

The central plain of Veneto, dotted with a few small cities, several urban centres, numerous small towns and villages, many medium-size industrial areas, and finally many isolated houses scattered all over the territory, is an area of sloping land between the Alps and the Venetian lagoon, characterized by an extensive system of infrastructures and a pervasive process of humanization of the landscape. During the last decades of the 20th century, new ways of living and patterns of settlement emerged in this region, distancing themselves from the traditional image of the city or town. For this reason it is necessary to think of these territories not as a city to be qualified by an adjective (dispersed, fragmented, scattered, etc.), but rather as more vague 'inhabited territories'. These are regions where people live, work and spend their leisure time in a multiplicity of scattered widespread locations, and where

the traditional city is only one of the urban patterns, and not necessarily the principal one. Territories, societies and economies that also include towns and cities, but that are not culturally dominated by them: these territories embody their own leadership.

In the Veneto region, dispersion is an enduring characteristic, traditionally rooted in the territory and its history. Paradoxically, the dispersion of houses and factories that occurred throughout the last three decades has led to a densification of this phenomenon, taking place in a territory that was already clearly moulded by human hands, where an extensive infrastructure of waterways, roads, underground networks, and urban patterns was built over time, and has become predisposed to continuously accommodate new uses. In particular, focusing on some productive areas, we can see how innovative activities, new facilities and social practices arise within these spaces, changing them profoundly: the addition of new opportunities for artisanal works, collective services and facilities such as kindergartens, parks for town festivals, playgrounds and informal areas for games for children, canteens, spaces for open-air sports, wooded areas, bicycle paths connecting neighbouring towns. At the same time new ways of dealing with energy consumption and water management are arising, strongly contributing to change in these areas. These include the construction of water lamination tanks to collect the rain that falls on the vast impermeable surfaces, covered by photovoltaic panels, capable of limiting the evaporation of the water in order to reuse it in the closed-loop system of businesses or for irrigating nearby farmland.

In general, we can say that these activities and facilities are created in productive areas because they provide a large amount of surface area (both paved and green, according to the planning standard law). As a whole, they are an indication of some profound changes in the practices and ways of interpreting the territory, where the productive areas

represent an opportunity for new inclusive contexts, spaces with amenities to re-imagine.

Those characteristics, together with the capacity to withstand the recent economic and global financial crisis, albeit with decreased performance compared to the previous decades, move us to devote renewed attention to the organization of productive areas. Generally speaking, the Veneto region settlements, which are characterized by an important diversity even within productive areas, provide evidence that it is possible to produce and sell goods, take advantage of collective facilities, and spend leisure time without major conflicts arising between these different kinds of activities. Today coexistence and the compatibility of various functions within the same production area have improved the social inclusion and liveability of the region, and the presence of different actors encourages innovation and creativity in increasingly competitive fields.

Can anything be learned from the Veneto region experience? Perhaps this case study can contribute something about how to find a new form of diversity, how to make compatible different functions that articulate space, time and practices. This approach could enrich the huge number of open spaces that characterize the Zona Franca, offering the city new opportunities for collective activities that need large areas with good public-transport connectivity, where for example noise at night need not be a problem. At the same time this kind of approach can present an opportunity for young people to find space for new artisanal forms of production, which can complement and enrich the typical standardized processes of industrial production.

To sum up, learning from the industrial areas of the Veneto could result in focusing on mixed-use areas, in a more innovative and socially inclusive way than at present, and with a multi-level relationship with the surrounding territory.



A BRUSSELS PERSPECTIVE – FOOD, BRAINS & CITY

Jens Aerts

Brussels and Barcelona are in many ways comparable: European cities built upon the typical historical layers, composed of a complex but fairly compact set of urban tissues, mostly with well-defined district centres, clear building alignments, a patrimony of monuments, distribution arteries, airy parks and remarkable landscape features such as their topography, nearby green areas and brooks. In both cities there are many different urban patterns of diversity that have been produced, at various times, with their own specificity, a reflection of urban development at that moment in history: places for economic production, housing and leisure.

While Barcelona leads as a political centre at the regional level, it is also an international tourist destination and has recently become home to specific hi-tech and communication industries in the 22@ area. Looking through the spectacles of buzzword-related attractiveness, we tend to forget that Barcelona had and still has very powerful logistic hubs and industrial areas. Logistics and industry coincide in the Zona Franca, a well-defined, compact, central but purely industrial area in the urban agglomeration.

In comparison, the capital of Europe by default, Brussels has not developed a strong industrial or economic development strategy. Despite an explicit strategy for economic production and logistics, Brussels' industry is encountered in a very genuine but clumsy way right at the heart of the city in the form of the canal to Charleroi, once the major industrial backbone of a young country, nowadays an industrial-heritage landscape. Using the simplistic image of the canal zone

as a dangerous location, productive activities and transportation of goods seem to pass by as an underworld activity: mostly invisible but omnipresent, informal and without a clear policy, human but without clear expression, everywhere yet with no clearly defined space.

While the Zona Franca springs to mind as the perfect example of a contemporary version of the urban economic model of Fordism, Brussels intrigues as an assembly of finely grained economic compositions in the centre of the city, along the canal, in a state of slow decay, transformation or modernization, embedded in a highly populated tissue, with many broken dreams of prosperity and urban qualities. A postmodern valley for liberal entrepreneurship in a socio-democratic urban constellation.

The site of the Abattoir slaughterhouse and the Erasmus university campus, slightly south of the city centre and squashed in along the canal, is an exceptional non-residential urban area between highly densely populated neighbourhoods. Its configuration expresses an industrial logic, yet on a smaller scale than the Zona Franca, but definitely more central and present within daily city life. Both Abattoir and Erasmus contain specialized activities, each with its own primary functionality, but possess at the same time a set of derived activities with a high potential to foster a unique urban mix, specific types of social exchange and new types of public space, and thus to become enormously intensive exchange platforms for a new urban realm.

As a major goal, the design studio 2013-2014 at VUB focused on dissecting in detail the precise functioning of the slaughterhouse – which also seems to be the most intensively used open market place in Brussels – and the university campus – which has the capacity to develop a stronger spatial and programmatic identity, as a knowledge hub focusing on Art, Design and Technology along the canal. Through this focus on historic and contemporary functionalities, an evolutionary path could be plotted, based on short-term interventions, human scale and shared space. Remark-

ably, the research concluded that this specific site should be opened up towards the surrounding neighbourhood, not by scattering housing as the easy formula for success, but above all by helping the existing programs to become more interdependent, so that a cluster of activities can nourish a complete cycle of sustainable development that has relevance at district, urban regional level: education, research, job creation. Secondly, basic spatial and typological adaptations could intensify the relations with the surrounding neighbourhood, such as upgrading access to the metro station or pedestrian bridges across the canal.

In a second wave, the Erasmus Intensive Program exercise, focusing on possible co-generative design strategies for sustainable urban metabolism, was tested in a strict methodological way. Despite the limited amount of available data, the search for possible co-generation elements revealed logical but as yet ignored potentials. As a largely mineral zone in the valley of the Senne river, more buffering and infiltration capacity could be created by the proposed transformation of the many parking spaces into more permeable open spaces, thus also offering other functional uses such as temporary playgrounds. The presence of heat-producing activities would make the upcycling of energy for nearby housing and other heat demanding programs easy to implement. Especially in a city that has virtually no ways of producing its own energy, but nevertheless has high demand, and does produce some energy in economic areas close to residential areas, this strategy of district heating through energy recuperation confirms the relevance of continuing to develop compact cities and building complexes.

In conclusion, through the methodology and focus on urban metabolism, the Abattoir and Erasmus site deserves recognition as a unique site for an urban economy, not only so that it becomes more integrated with its surrounding districts, but above all to secure this site as an exchange hub with strong technical, social and programmatic links through its openness, its core economic activities and the

presence of a strong mobility network. In comparison with the Zona Franca in Barcelona, Brussels could be its down-scaled version, with more local links and a more varied and complex presence of human patterns, both formal and informal. This latter condition is probably unique to this area, known as ‘the city of arrival’ and ‘the belly of Brussels’ – so local and yet so global.

A BRUSSELS PERSPECTIVE – OUT OF FOCUS

Nadia Casabella

HAREN

Imagine Haren and its phantom-like appearance, its contemporary irrelevance – at least at first sight. The things we notice do not belong to what we traditionally would recognize as a city. They appear rather as bygone prophecies, from an early 20th century movie, speculating on how a future city might look. Its irrelevance shows up mostly as traces: the traces of neglect, sometimes of abandonment that some buildings exhibit. There is dirt, the wounds in their fabric, and a tinge of romanticism as plants start to grow, infused in the built structures. You also notice that infrastructures outside the city do not need to negotiate their presence with the rest. The more this happens in a particular place, the more this place becomes a junkyard of discarded functions, and the more it stays out of focus: incinerators, cemeteries, prisons, social housing, switching yards, wastewater purification plants, public transport depots.

Haren is a village that belongs to Brussels City. It is one of the 19 municipalities of the Capital Region, located at the northern edge of the region and thus Brussels’ rear end, next to Flanders, located in a densely urbanized context, along the canal that served as the backbone for the rapid industrialization of the newly created Belgian nation (during the 19th century and up to the First World War). It also lies next to the motorway ring-road encircling Brussels, a stone’s throw away from the airport, and surrounded by some of the most dynamic zones in the entire metropolitan region: where NATO is building its new headquarters, three-in-a-row

with the latest, and biggest, upcoming commercial developments (the Docks, U-Place, and Heysel), and aligned with the planned Brussels multifunctional logistic platform. Haren is place where its inhabitants have learned to live with progressive dispossession despite its location in the metropolitan epicentre.

HAREN IN BRUSSELS

If Brussels, unlike other old industrial European powerhouses, has managed to stay afloat it is thanks to this metropolitan dynamism, which started as part of a process to develop the tertiary sector under the aegis of Expo 58. An entire road-web was built to connect the newly built offices to the rest of the country, attracting a flock of commuters who nowadays represent some 60% of the regional workforce, and whose productivity possibly justifies the high position of Brussels in the European rankings: third after London and Luxemburg. Unfortunately, this ‘tertiarization’ happened rather brutally and with a lack of respect for the existing manufacturing sector in Brussels at that time, which was extremely diverse and dynamic. Tertiary activities were regarded as a new economic sector, replacing the old instead of being complementary to a mature metropolitan economy. The lack of a supportive policy at the urban or metropolitan level left many companies in bad shape, a situation that worsened when the economic crisis hit the world economy in the early 1970s. Some managed to survive, others went bankrupt, and yet others moved to the periphery, looking for cheaper and bigger spaces that were able to fulfil the new spatial needs linked to the containerization of goods and other technological changes affecting their operation.

Deficient policies in the early 1980s, relying on massive infrastructure investments (e.g. enlargement of the Charleroi-Brussels canal and South station) that had proved adequate during the post-war period, left a trail of unemployment, most dramatic among the jobseekers whose skills did not match the new labour market

requirements. In recent years, the regional government has taken responsibility for this, but rather than helping the approximately one in five jobseekers to move up the ladder, the direction chosen consists of subsidizing low-skilled jobs for non-skilled job seekers – in which people from outside the region end up filling the jobs, because they seem better trained. The truth is that certain intangible qualities of socio-economic dynamics seem to hold the key to the generation of virtuous cycles of wealth creation and innovation, and these are difficult to design through policy because they rely on the social fabric of a city, which straddles many dimensions. The best way towards the reduction and eventual suppression of inequalities will necessarily involve a policy that believes in the diffusion of knowledge and invests in training, skills and local entrepreneurship, contributing to productivity growth in every sector.

THE ZONA FRANCA

Facing a wide, sweeping plain located in the Llobregat river delta, the Zona Franca is a hostile landscape, traversed by an oversized infrastructure network (road, railway and utilities) and delineated by overlapping fences. Nobody is watching, just the CCTV and the fences – all sorts: chicken wire, brick, mortar – designed to prevent trespassing in companies’ property and parking lots, along motorways and in the harbour. Those fences in turn generate large amounts of residual space, which is extremely dry while simultaneously bearing the incisive traces of violent runoff. Where does all the overflow go? The sewage grates and the surface gutters point to an engineered underground system, where everything is mixed together. Overall there are signs of neglect: not the type of neglect resulting from abandonment or redundancy, as we saw in Haren, but the neglect that comes from extreme rushing, and a certain form of inefficiency, hefty chunks not needing to be neat in order to manoeuvre. Probably the same neglect that has pervaded

our cities for centuries, while they were in the making, spreading as far as the prevailing technology allowed it and the inattentiveness to the standards of conduct jeopardized the sheer agreements needed for living together. Neglect happens by default in the out-of-focus areas, outside the focus of policy, of investment, of care... yet in the case of the Zona Franca this is coupled with extreme economic dynamism: a new container harbour, Mercabarna, the cruise-vessel harbour (attracting some 3.5 million tourists to the city each year), and a strategic location between the harbour, the airport and the railways.

FROM FREE TRADE TO URBAN ENTERPRISE ZONE

Barcelona's Zona Franca was planned originally as a free trade zone. Its future seems to be at a turning point though, caught between a policy that would continue to subsidize (if only indirectly) foreign and national manufacturing companies, and a policy attempting to attract new companies representing cutting-edge novelty. In fact, the policy transition seems to reflect a move from a 'free trade zone' to an 'urban enterprise zone' (UEZ) where public ownership of the ground created as a result of land reclamation is retained. By offering an explosive combination of infrastructure incentives and reduced regulations, the Zona Franca is managing to attract higher added-value activities that can make more efficient use of a location that has seen its position change from peripheral to being at the centre of major redevelopment projects, whilst also managing to avoid rejecting all manufacturing enterprises. These kinds of mechanism seem more suited to accommodating innovative businesses in search of cheap space, good services (not forgetting premium qualities such as efficient public transport, cheap energy or outstanding communication facilities), and above all enjoying the kind of (semi-)public coordination that can give rise to all kinds of positive externalities: training facilities, improved collaboration, greater transparency. They also seem more

expedient because they are based on intangible qualities that have an effect on how space gets organized rather than on land-use and zoning instruments, which are more prone to undesirable distortions (e.g. increased spatial segregation, employment and company relocations) rather than creation, real estate speculation, and sturdiness in the face of changing economic conjunctures. Should the extreme liberal UEZ model become the transformed durable development model? Could the sluggish industrial zone of Dobbelenberg in Haren and the linear industrial development along the Vilvoorde avenue become valid test cases for an eventual application of the UEZ model? One thing is sure: we would be extremely wrong not to seize this opportunity collectively and transgress our deepest taboos.

PROFILES

STUDENTS

Sarah Avni (BE) is finishing her Master's in Architecture at the ULB Faculty of Architecture in Brussels. Her work largely focuses on the understanding and interpretation of domestic space in contemporary housing.

Alberto Balzan (IT) is in his final year of a bachelor's in Architecture at the IUAV University of Venice. He participated in two workshops with Francesco Venezia and Guillermo Vazquez Consuegra during the summers of 2012 and 2013, and collaborated with the FEBO Ferrari Bosio Architettura studio during the summer of 2013. He made a study trip to Athens with Professor Francesco Guerra and another to Chicago and New York with Professor Giancarlo Piretti. His interests include photogrammetric and structural mechanics.

Luis Bellera Fernandez de la Cruz (ES) is in his final year of Architecture at the Barcelona School of Architecture, ETSAB. In 2011 he received a scholarship to study for one year at the Madrid School of Architecture, ETSAM. During 2012 and 2013, he did internships at the Rockwell group and Multiplicities, both in NY. In winter 2013 he worked in the Jorge Perea Studio on the 'Plaça de les Glories' competition and participated in the exhibition 'Made in Europe' at the Venice Biennale of Architecture. He is currently working on his thesis project about urban infrastructure.

Enrico Bivi (IT) is in his final year of a Bachelor of Architecture at the Università IUAV di Venezia. He helped set up the 'Traces of centuries and future steps' exhibition for the 13th Venice Biennale of Architecture.

Johanna Boudart (BE) is studying for a Master's in architecture at the ULB Faculty of Architecture. She is specializing in ecological architecture

and urbanism and is currently working on her Master's thesis, which will analyse the economic cost of sustainable houses.

Elsa Bouillot (FR) is a Bachelor's student at the ULB Faculty of Architecture. She has interest in urban metabolism and landscape design.

Mathieu Champougny (FR) is a Bachelor's student at the ULB Faculty of Architecture. He is interested in the discipline of urbanism and urban metabolism.

Diego Cisterna (ES) studies architecture at the Barcelona School of Architecture, ETSAB. He will finish his studies next year at PUC in Santiago de Chile. He has participated in different workshops including 'Sa Falca Verda' in Palma de Mallorca. He collaborates with the Enric Miralles Foundation and is interested in urban design.

Davide Del Favero (IT) is in his final year of a Bachelor's in Architecture at the Università IUAV di Venezia.

Cristina Di Francia (IT) is in her final year of a Bachelor's in Architecture at the Università IUAV di Venezia.

Giovanni Eberle (IT) is studying architecture at Università IUAV di Venezia. He has done an internship at Carlo Barbieri Architetto and two intensive workshops with Taormina Architects and TAM associates.

Manon Elter (LU) is currently finishing her Master's Degree in Architecture and Urbanism at the ULB Faculty of Architecture. She graduated from high school, specializing in visual arts and design. In 2013 she did an internship at M3 architects and at N-Lab architects both based in Luxembourg.

Céline Foubert (BE) is currently finishing a Master's in Urbanism and Architecture at the ULB Faculty of Architecture in Brussels. She studied for

a year on an Erasmus grant in Germany at the RWTH University Aachen. In 2013, she attended the 'End of Line' Master Class in Brussels for international students.

Júlia Gallardo Andrés Bellera (ES) is studying architecture at ETSAB in Barcelona, and is currently finishing her final project. This year she is collaborating with the Mies Foundation for the Biennale in Venice. She combines her studies with her hobby of making illustrations.

Camille Gardien (FR) is completing her first year of a Master's in Architecture in the Faculty of Architecture at ULB. She is interested in large-scale approaches to territory, composition and growth of the contemporary city, and in particular the importance of water in the landscape. She is thinking about doing her Master's thesis on the link between water and urbanism.

Francesco Guizzo (IT) is in his final year of a Bachelor's in Architecture at the Università IUAV di Venezia. He collaborated with the studio of Arch. Ursula Ferrari during 2013. He participated in two workshops with Francesco Venezia and Guillermo Vazquez Consuegra during the summers of 2012 and of 2013.

Antoine Horenbeek (BE) is currently in his final year of a Bachelor's in Architecture at Faculty of Architecture of ULB in Brussels, and has been selected for an Erasmus scholarship at Universidad Francisco de Vitoria in Madrid for 2014-15. He completed an internship at Ateliers des Architectes Associés in Brussels and participated in a construction and renovation workshop at the CQPHT in Casablanca, Morocco.

Ferran Iglesias (ES) has been studying architecture and urbanism since 2008 at the ETSAB in Barcelona. His thesis project focuses on mobility infrastructure and landscape in

Madrid. He is currently working at Àrea Metropolitana de Barcelona (AMB).

Ludovica Imperato (IT) is in her final year of a Bachelor's in Architecture at the Istituto Universitario di Architettura di Venezia (IUAV). Filippo Marchiori (IT) is in his final year of a Bachelor's in Architecture at the IUAV, Venice.

Engy Khaled (BE) is in her first year of a Master's in Architecture at ULB LacambreHorta in Brussels. She has participated in a workshop on public space in Hong Kong, '9394,06 km, Twin Design Research Studios'.

Adrien Laügt (FR) has a Bachelor's Degree in Philosophy and is currently a Master's student in architecture at the ULB. He is particularly interested in emergent, prospective design practices for planning of urban space, landscape and territory.

LOUISE Lauwers (BE) is in her final year of a Master's in Architecture at ULB Faculty of Architecture in Brussels, which includes a one-year Erasmus exchange in Prague, Czech Republic.

Nitay Lehrer (IL) trained as a professional contemporary dancer in the Netherlands and made the transition to architecture studies three years ago. He is currently finishing his Bachelor's degree at the La Cambre Horta School of Architecture in Brussels.

Leonoor Leus (BE) is currently in her last year of a Bachelor's in Architecture at ULB La Cambre Horta in Brussels, and was selected for an Erasmus scholarship to study at the Madrid Europea Universidad in 2014-15. She participated in a workshop at the FAUP in Porto during the summer of 2013, working in studio with Johan Anrys (51N4E), where she gained insight into the social and spatial appropriation of public space.

Sephora Loaiza (FR) is in her first year of a Master's in Architecture at ULB La Cambre Horta in Brussels, and is currently preparing for an internship in an architecture office in Seoul, Korea.

Alberto Lunardi (IT) is in his final year of a Bachelor's in Architecture at the Università IUAV di Venezia.

Filippo Marchiori (IT) is studying Architecture at Università IUAV di Venezia. In his third year, he will finish the first part of his studies this year.

Chantal Marfà (ES) is studying Architecture and Urbanism at ETSAB in Barcelona, and is currently working on her final project. During the past year, she worked at the Mies Van Der Rohe Foundation, helping to design and assemble the 'Fundamentals' exhibition at the 14th International Biennale di Venezia. At present she also works at '2bmfq architectes'.

Matthias Mazelier (BE) obtained his Bachelor's in Architecture from ULB Brussels. His degree brought him from spatial studies to a broader range of artistic interests, including animating participative workshops and organizing art and architecture discussions. In 2013 he had the opportunity to build a residence in Colombia and later he co-founded the Producers Artfair which was held in Hamburg in September.

Koen Merken (BE) graduated in Landscape Architecture in 2010 and he is currently studying at the Vrije Universiteit Brussel for a Master's in Urbanism and Spatial Planning. He has worked since 2012 at Ontwerpbureau Pauwels in Leuven, where he has gained professional experience as a Landscape Architect.

Charlotte Merveille (BE) is currently completing her Master's in Architecture at the ULB Faculty of Architecture. She is specialized in ecological

architecture and urbanism and is currently working on her Master's thesis, which addresses the renovation of Belgian mining towns.

Alessio Milan (IT) is finishing a 3-year Bachelor's degree at the IUAV, Venice.

Fernando Montoya Martinez (ES) has been studying Architecture since 2006 at the ETSAB in Barcelona. He has participated in several student competitions and urbanism workshops, and has obtained some encouraging results. Since 2013, he has been collaborating in Jorge Perea's Studio and LUB (Laboratory of Urbanism of Barcelona) while completing his final project for his study.

Patrick Morgado (PT) is studying for a Master's in Architecture at the ULB Faculty of Architecture, specializing in ecological architecture and urbanism. Next year he will be working on his Master's thesis, in which he will analyse the sustainability of passive houses. He participated in the 'End of Line' Master Class in Brussels in 2013.

Diego Necochea (PE) is currently a Master's student at the ULB Faculty of Architecture. His master's thesis is an analysis of urban densification in Lima based on sustainable development criteria. He did an internship at Espaces-Mobilités, an urban planning and design firm in Brussels.

Nadja Nys (BE), a formal social worker, started a new career after finishing her studies in landscape architecture in 2012 at Erasmus Hogeschool Brussel. Since then she has worked for the Flemish Company for Social Housing, in the department of infrastructure. At present she is finishing her Master's in Urbanism at VUB Brussels.

Anna Pagliaruso (IT) is in her third year of studying Science of Architecture at IUAV in Venice

and will finish the first part of her studies this year. She did an internship at Veneto Region's Urban planning offices and three intensive workshops with Gonçalo Byrne, ETB studio and Sean Godsell.

Diana Palade (RO) is studying Architecture at ULB in Brussels. In 2012 she obtained an Erasmus internship at the ETSAB School of Architecture in Barcelona. In October 2013 she participated in a workshop in Hong Kong, 'Liquified space', which explored the hybrid condition of vertical cities.

Alessandra Palentina (IT) is in her final year of a Bachelor's in Architecture at the Università IUAV di Venezia.

Thomas Pesce (IT) is in his final year of a Bachelor's at the Università IUAV di Venezia. He participated in a workshop at the IUAV during the summer of 2012 with Alberto Cecchetto and during the summer of 2013 with Tyin Tegnestue Arkitekter.

Eftalia Proïos (ES) is currently studying architecture and urbanism at the ETSAB in Barcelona. She has participated in several competitions, among them the third edition of the IS Arch awards (for which she received an honourable mention). In 2013 she collaborated with Ramon Sanabria studio in international competitions in Germany and Poland, participating in the design of the winning proposal for Krakow's Maloposka Parliament.

Aurèle Rattez (FR) has a Bachelor's in Architecture from ENSAN in France. Between his Bachelor's and his Master's, he chose to gain professional experience by working for one year in the office of 51N4E. He is currently studying for his Master's in Architecture at the ULB in Belgium.

Laura Rijsbosch (BE) graduated magna cum laude in 2011 from the KU Leuven

with a Master of Science in Engineering: Architecture. She is currently studying for a Master's in Urbanism and Spatial Planning at the Vrije Universiteit Brussel. Since 2011, she has worked as an architect in Architectenbureau Jan Maenhout in Brussels.

Vittorio Salvadori (IT) is finishing his 3-year Bachelor's degree at the Università IUAV di Venezia. He worked as a graphic designer for the book 'Architetture Venete rustici e ville minori' (Ed. RG).

Anahí Sanz (ES) is her final year of Architecture at ETSAB in Barcelona and is currently completing her graduation project. She has participated in various international workshops on urbanism and architecture including BESides Tourism and POSTsuburbia. She works in a wide range of creative arts, such as photography and abstract painting, through which she explores architecture and life.

Stefano Teker (MU) is currently finishing his Master's in Architecture at the ULB Faculty of Architecture. He is doing his thesis at LOUISE in Brussels, for which he is analysing the valleys of Lubumbashi in Congo RDC and the opportunities that they represent for the city.

Elise Tonglet (BE) is in her final year of a Bachelor's in Architecture at the ULB Faculty of Architecture. Next year she plans to go to Switzerland to continue her studies in an ecological and natural way. She is interested in the relationship between large-scale territorial approaches and their impact on nature and farming.

Kristien Van den Houte (BE) studied Architecture at Sint Lukas, Brussels and has worked at several studios including Lucien Kroll's A.U.A.I. She headed the Housing Service at the Ministry of Brussels Capital Region for 5 years and is now studying Urbanism and Spatial

Planning at the VUB, Brussels. In 2012 she completed a Master's of Collective Housing at the ETSAM, Madrid. She is currently a member of Cosmopolis-Urban planning, a research team hosted by the VUB.

Ivan Vander Seypen (BE) is a Master's student in the Faculty of Architecture at ULB.

Theo Vantomme (BE) is studying Urbanism and Spatial Planning at the VUB and has recently finished an internship at MAAT – Ontwerpers.

Matteo Vianello (IT) is finishing a 3-year Bachelor's degree at the IUAV, Venice. He was selected to assist the Padiglione Venezia at the Biennale di Venezia 2014 with the University.

Marina Vila (ES) is a student of architecture and urbanism at ETSAB in Barcelona. She is currently working on her final-year project, which addresses the refurbishment of the old Hofpleinlijn railway in Rotterdam. She was an exchange student at the Landscape and Architecture Studio in Stockholm for one year, and did a six-month urban planning internship at MLA+ in Rotterdam.

Manon Wettstein (FR) is currently completing her Master's at the ULB Faculty of Architecture in Brussels. She recently finished a year as an intern with CBC Peru Leed and Christian de Portzamparc. These two internships gave her a chance to explore two passions of hers: architecture and urbanism, gaining first-hand knowledge of sustainable design and territorial decision-making.

TUTORS

Jens Aerts graduated as an engineer-architect at the KU Leuven in 1997. After gaining experience in offices both locally and internationally, he graduated with a Master in Urbanism in 2001 at the UPC Barcelona. He then became advisor in urbanism for the Vlaams Bouwmeester (2002-2004) and for the Minister in charge of Mobility and Public Works of the Brussels-Capital Region (2004-2009). He is now an partner at BUUR | bureau for urbanism and specialises in strategic planning, master planning, project and town planning supervision. At BUUR he is mainly in charge of projects in Brussels, such as the development plan at Marco Polo, the renewal of Rue Neuve and the master plan for Biestebroek. Since 2011, he is guest professor of the Master of Urban Design and Spatial Planning at the Cosmopolis research group at Vrije Universiteit Brussels (VUB).

Andrea Bortolotti is architect graduated at the Università IUAV di Venezia (2010) with a project thesis on open spaces and sustainable urban water drainage systems for the metropolitan area of Milan. He practiced as urban designer collaborating in different activates of the Department of Urban Studies of the Politecnico di Milano (2011- 2013), and since 2012 he is member of the association Latitude Platform for Urban Research and Design, based in Brussels (BE) and Venice (IT), with which explored the themes of environmental risk and territorial cohesion. Since 2013 he is collaborating with the LOUISE research center of the Faculty of Architecture de l'ULB and he is now enrolled in the ULB PhD program in Art de Batir et Urbanisme (2014).

Nadia Casabella is architect (UPC Barcelona) and MSc in Regional Planning (LSE). She chooses to work rather exploratorily than problem-solving oriented, straddling across research, teaching, and

practice. She is currently project assistant at the Faculty of Architecture of l'ULB, and lecturer at the VUB (master urban design and planning SteR*). She is about to complete her PhD on the topic of regional, railway-based public transport. In 2010 she founded with Bert Gellynck the architecture and urbanism practice 1010 [ten-ten], aimed at producing architecture on the scale of the city. Among their last undertakings, the master plan for Brussels' South Station in collaboration with Güller+ Güller and ZUS, runner-up in an international competition, and the Farmhouse for the Parckdesign biennale exhibition in Brussels (2014).

Carles Crosas is PhD Architect (ETSAB Barcelona). He has been teaching urbanism at the School of Architecture of Barcelona since 2001 and has been invited to other universities. Former collaborator and assistant teacher to Professor Manuel de Solà-Morales, he is researcher at the Laboratory of Urbanism of Barcelona (LUB) where he co-edits D'UR and he presented his PhD dissertation on the urban transformation of La Havana (2009). Concurrently, he set up his own studio where he works on diverse projects and plans of varying scale. He has participated in several urban projects competitions, being awarded on two occasions by European.

Catalina Codruta Dobre is an architect and currently a doctoral researcher within the LOUISE research centre of the Faculté d'Architecture de l'ULB. Based on her experience in research and urban design in cities in Europe and Asia, she started a research project in January 2013, on the topic of water management. Her thesis investigates the role of new concepts such as 'Water sensitivity' in the process of urban regeneration. She is a founding member of Risk & Architecture Workshop association (RAW). In line with these topics and interests, Catalina has organized student design workshops as well as conferences in

collaboration with the LOUISE research centre and RAW.

Geoffrey Grulois is an engineer and architect (FPMs & Tokyo University). He trained as an architect and urbanist in Curitiba (IPPUC), Barcelona (AAA) and Tokyo (Arata Isozaki Architects) from 1996 to 2002. He is teaching at La Cambre school of Architecture from 2004 and at the Faculty of Architecture of ULB since 2011. In 2005 he co-founded the master urban design studio Space Speculation. In 2011 and 2012 he initiated the Resilient Ishinomaki Workshops. Since 2012 he is co-coordinator of LOUISE – research Laboratory of Urbanisme, Infrastructure and Ecologies.

Géry Leloutre is an architect (Horta Institute for Architecture, Brussels, 2002) and urban planner (KU Leuven, 2006). He combines an architectural practice with an in-depth theoretical reflection about the city. He is project teacher of the design studio 'Space Speculation', researcher and PhD candidate at the Faculté d'Architecture de l'ULB. He has been the editor-in-chief of BrU (Brussels review of urban planning) from 2006 to 2008, the moment he founded the office Karbon' with Bernard Baines, Victor Brunfaut, Matthieu Delatte, and Hubert Lionnez.

Samuel Llovet Montardit (SP) graduated in 2012 from the ETSA Barcelona. Currently coursing the Official Research Master in Urbanism at the ETSAB and working in the architecture & urban design JPAM as collaborator since 2012 where has been involved in the development of projects such as Plaça de les Glòries competition, the volumetric study of Plaça de les Glories future design as team coordinator, the Coolsingel Street competition, studies of the urban environment of the Sants high speed station, studies on the transformation of the industrial port of Barcelona or the design of two Cerdà blocks in the 22@ quarter. He has been published in several ocations

such as *Future Magazine*, *RE: Work Making place for industry* or *Barcelona LINKS* for his individual work.

Benoit Moritz graduated as an architect at the ISACF-La Cambre and urban planner at the UPC Barcelona. In 2001, he cofounded the office MSA with Jean-Marc Simon. He additionally developed a teaching and prospective research activity at the Faculté d'Architecture de l'ULB, where he is the co-coordinator of the Laboratory on Urbanism, Infrastructures and Ecologies (LOUISE). Within MSA, Benoit Moritz is responsible for urbanism and public space projects, such as the master plan for the development of the sustainable district Tivoli, the renewal of the Place de la Monnaie, the footbridge on the «Cage-aux-Ours» square and the recently approved masterplan for the regeneration of the Saint-Gilles and Forest Prison site. Benoit Moritz is also the author of many articles related to urbanism.

Jorge Perea is an architect and planner. A disciple and collaborator of Manuel de Solà-Morales from 1996 until his passing away, he then opened a professional studio in 2012 to follow his theoretical discourse and reflections on the modern city. Former urban design professor at IAAC, the University of Chicago, at Barcelona (IES) and Syracuse University (EUA), he teaches since 2007 at the Department of Urban Design at the ETSA Barcelona. Currently his studio is developing Manuel de Solà's Operaplein project, the renewal of Antwerp's central area. In Barcelona, he developed the reform of the urban environment of the Sants high speed station, reflections and approaches on the transformation of the industrial port, the creation of a new urban centrality in a suburban context in Vallldoreix in the metropolitan area of Barcelona, and the design of two Cerdà blocks in the technological quarter of 22@ in Barcelona.

Cristina Renzoni, architect (2003) and Ph.D. in Urbanism (2008), is currently post-doc research fellow and adjunct professor of Urban Design at the Università IUAV di Venezia. Her main research interests focus on the role of social services and public facilities in the transformations of the contemporary European cities, and on the history of spatial planning throughout the XXth century. Her most recent research focuses on gender-specific demands for welfare between the 1950s and the 1960s, and on the history of urban facilities in Italian planning. She was guest-editor of *Questions of gender, questions of space. Women and cultures of inhabiting* («Territorio» 69/2014, with P.Di Biagi) and she co-authored the volume *Spazi del welfare. Esperienze luoghi pratiche* (Officina Welfare Space, Quodlibet, 2011). She wrote a book on national spatial planning in 1960s Italy: *Il Progetto '80. Un'idea di Paese nell'Italia degli anni Sessanta* (Alinea, 2012), and she recently completed the book *Explorations in the Middle-Class City: Turin 1945-80* (with G. Caramellino and F. De Pieri, Lettera22, in press).

Michael Ryckewaert is an engineer-architect and urban planner and holds a PhD in architecture. He is associate professor of urbanism at VUB, where he coordinates urban planning research in Cosmopolis Centre for Urban Research and heads the Master in Urban Design and Spatial Planning. He is also a postdoctoral researcher at KU Leuven. His research focuses on housing and spatial policy. Other key research interests are the history of urbanism, infrastructure, and mobility. Michael Ryckewaert has published on social housing, urban housing projects, urbanism, and mobility history.

Sybrand Tjallingii is an urban planner with a background in ecology (Utrecht University). He taught at the school of Architecture TU Delft. Then he specialised in green area and water planning and worked

at ALTERRA – Wageningen, as a researcher and consultant in local and regional projects. His theoretical work includes a PhD study on planning and ecology. He retired as an associate professor at the School of Architecture of TU Delft. Presently he is guest professor at IUAV Venezia and ULB.

Maria Chiara Tosi, is associate professor in urbanism at IUAV the Università IUAV di Venezia and also members of the board of the PhD in urbanism. She worked on various city master plans (Brescia, Pesaro, Macerata, Ferrara, Feltre, Belluno, Venice). Her research and work is mainly focused on the processes of transformation of the territory, and the relationship between welfare policies and the construction of the city. Among her books: *Tracce di città* (2001), *Toward an Atlas of Delta Landscape in Europe* (2013), *Welfare Space. On the Role of Welfare State Policies in the Construction of the Contemporary City* (2014).

Fabio Vanin is an architect (2003) and urban designer and holds a PhD in Urbanism (2008). He is assistant professor of landscape urbanism at VUB Brussels where he teaches at the Master in Urban Design and Spatial Planning. He is co-founder and director of Latitude Platform for urban research and design. His main research interests focus on the relation between discourses and practices in the production of space – especially on lusophone cities – urban safety and environmental risks. He has participated to international researches and has collaborated with several universities in Europe and abroad (TU Eindhoven, KU Leuven, SUPSI Lugano, WITS Johannesburg, UEM Maputo). Fabio Vanin has recently published the books *Maputo, open city* (FSH, 2013) and *Pancho Guedes – Vitruvius Mozambicanus* (IUAV, 2013).



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Mistral

PRINTING

BEMA-GRAPHICS NV/SA

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This publication is made possible with the financial support of the Faculty of Architecture of Université Libre de Bruxelles, Université Libre de Bruxelles and the Erasmus Intensive Programme of the European Commission Lifelong Learning Programme.

ISSN: 2406-4335

This publication presents the results of a two-week Erasmus Intensive Programme organized in Barcelona's Zona Franca during spring 2014 in order to explore potential convergences between urbanism, urban metabolism and industrial ecology for planning sustainable European cities.